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RECREATION SPECIALIZATION AMONG BIRDWATCHERS OF ALBERTA

BY

BONITA LYNN MCFARLANE

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A THESIS SUBMITTED TO THE FACULTY OF GRADUATE STUDIES AND RESEARCH IN
PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF
DOCTOR OF PHILOSOPHY

DEPARTMENT OF RENEWABLE RESOURCES

EDMONTON, ALBERTA

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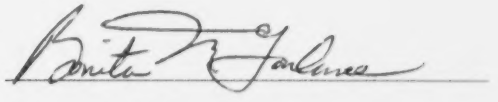

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The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies and Research for acceptance, a thesis entitled RECREATION SPECIALIZATION AMONG BIRDWATCHERS OF ALBERTA submitted by BONITA LYNN MCFARLANE in partial fulfillment of the requirements for the degree of DOCTOR OF PHILOSOPHY.

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Abstract

Birdwatchers represent a growing number of participants in wildlife-related recreation. Addressing their needs is important in supplying quality wildlife recreation opportunities and in gaining support for wildlife conservation. Previous birdwatching studies have lacked theory testing. This study applies the theory of recreation specialization to birdwatching. A mail questionnaire was developed and collected data from 787 birdwatchers in Alberta on specialization, motivations, attitudes toward wildlife, wildlife conservation activities, social aspects of birding, development and management preferences for birding sites, and socioeconomic characteristics.

Data on recreation specialization were used to develop a typology of birdwatchers. Four distinct levels of specialization were identified by cluster analysis and named casual, novice, intermediate, and advanced.

Four motivations emerged from the data as salient to birding: achievement, appreciation, conservation, and affiliation. The predominant primary motivation was to contribute to wildlife conservation. Primary motivations differed among levels of specialization. Casual birders had an appreciative orientation; novices and intermediates, a conservation orientation; and advanced, an achievement orientation.

Participation in wildlife conservation activities increased with specialization. A model was developed using ordinary least squares that examined the relationship between socioeconomic variables, specialization, attitudes toward wildlife, and participation in wildlife conservation activities. Specialization was a better predictor of participation in wildlife conservation than socioeconomic or attitudinal variables.

Social agents and the socialization process for specialization were examined to determine if specialization in birding follows a childhood determination model or a leisure career model of participation. Results supported a leisure career model. Specialization in birding was not influenced by the life cycle stage at initiation into the activity. Regardless of the life cycle stage at initiation, two socialization factors were identified as influencing specialization: participation with friends and members of organizations, and family support of one's birding activities.

The past experience/skill dimension had the highest correlation with motivations and was the best predictor of attitude scores and participation in two of four wildlife conservation activities, indicating that specialization dimensions have differential effects on motivational, attitudinal, and behavioral variables. Theoretical aspects of the specialization construct and management implications for wildlife-related recreation are discussed.

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Chapter I

Introduction

Background

Studies in wildlife-related recreation indicate that participants in nonconsumptive wildlife-related activities are the most prevalent users of wildlife in North America (Filion et al., 1993; U.S. Fish & Wildl. Serv., 1993). For example, in Alberta about 80% of the population watched, photographed, studied, or fed wildlife around their homes or on trips during 1991; whereas, about only 25% fished and 7% hunted (Filion et al., 1993). Predictions of future participation rates indicate that high levels of involvement in nonconsumptive uses are expected to continue into the 21st century (Filion et al., 1992). Recreation and wildlife management agencies have recognized the importance of the nonconsumptive client. They are being challenged to develop products and programs that meet the needs of the nonconsumptive user (Driver, 1985; Thorne, Brown, & Witter, 1992), to develop financial mechanisms for expanded services to address the increased interest in participation, and to gain support for wildlife conservation from this constituent (Lyons, 1987).

One group that represents a growing number of nonconsumptive participants in North America is birdwatchers (Kelly, 1987:77-78). Estimates of participation in the United States now exceeds 61 million (Hall & O'Leary, 1989). In Alberta, about 40% of the adult population participates in some form of birdwatching (Manecon Partnership, 1991). In addition to growing numbers of participants, birdwatchers have been shown to represent a potential economic and political influence for wildlife conservation (Hvenegaard, Butler, & Krystofiak, 1989; Wiedner & Kerlinger, 1990). Therefore, addressing the needs of birdwatchers is important in supplying quality wildlife recreation opportunities to the nonconsumptive user and in gaining support for wildlife conservation and management from the nonconsumptive constituent.

Studies on birdwatchers have primarily described socioeconomic characteristics, management issues, and expenditures of birders at specific locations (Applegate, Otto, & Buttitta, 1982; Applegate & Clark, 1987; Butler & Fenton 1987; Hvenegaard et al., 1989) or of birders engaged in special events

such as the National Audubon Society Christmas Bird Count (Boxall, Stelfox, & Hvenegaard, 1991; Wiedner & Kerlinger, 1990; Witter, Wilson, & Maupin, 1980). Although some studies have described motivations, attitudes (Kellert, 1985), and subtypologies of birdwatchers (Applegate et al., 1982; Butler & Fenton, 1987) their management needs are still a poorly understood. These studies of birdwatchers have been descriptive in nature and lacked the application or testing of theory.

This thesis will test the theory of recreation specialization among a sample of birdwatchers in Alberta. It will investigate the nature of birdwatching as a recreational activity by creating a typology of participants based on their expertise and involvement in birdwatching. Motivations for participating, attitudes toward wildlife, involvement in wildlife conservation, socialization influences, and socioeconomic characteristics will be examined. At the same time, theoretical aspects of recreation specialization will be examined in the context of nonconsumptive wildlife-related recreation.

Study Purpose and Research Objectives

Purpose of the Study

The purpose of this study is to apply the theory of recreation specialization to examine selected aspects of birdwatching among a sample of birdwatchers in Alberta and to examine theoretical aspects of the recreation specialization construct.

Study Objectives

1. To use the specialization construct to classify subgroups of a sample of birdwatchers in Alberta.
2. To determine if birders classified by specialization differ in their motivations for birding.
3. To develop a model which examines the relationship between socioeconomic variables, specialization, attitudes toward wildlife, and participation in wildlife conservation activities.
4. To determine if birders classified by specialization differ in their socialization influences in the activity.

Organization of the Thesis

This study is presented in a paper format. The first section provides a review of the birdwatching and recreation specialization literature. Paper I presents research methodology common to all subsequent papers, segments birders using the specialization construct, and presents results and discusses socioeconomic and birdwatching characteristics of the sample. Paper II deals specifically with motivations for birdwatching. A motivational scale is developed and differences among the clusters in motivations for birding are determined. Specialization within the context of a theoretical model of wildlife-related recreation involvement is discussed. Paper III develops a model of participation in wildlife conservation among birders and discusses the model's implications for theoretical aspects of specialization and implications for wildlife conservation. Paper IV examines the socialization influences for specialization in birding in the context of a childhood determination model and leisure career model of participation.

Review of the Literature

Birdwatching as a Recreational Activity

Improved field guides, development of better and less expensive binoculars, and an increased interest in nature and the environment have all contributed to an expansion in the number of birdwatchers (Kastner, 1986). Birdwatching has become a popular outdoor recreational activity in North America (Butler, 1984; Harrison, 1979; Scofield, 1978). North America now ranks second in the world, behind England, in terms of the percentage of citizens participating (Scofield, 1978). Depending on the definition of birdwatching, approximately 20 to 61 million people participate annually in the United States (Hall & O'Leary, 1989; Jacquemot & Filion, 1987; Kellert, 1985; Lyons, 1982; More, 1979; Shaw & Mangun, 1984). In 1981, over 13% of the Canadian population took trips for the purpose of observing, photographing, or studying birds (Jacquemot & Filion, 1987). In Alberta, about 40% of the population reported that they participated in some form of birdwatching in 1990 (Manecon Partnership, 1991).

Roger Tory Peterson divides today's birders into two groups: birders and birdwatchers. The former refers to the listers (those who keep a list of the species they see) and the latter to those who watch their feeders and backyards (Gibbons & Strom, 1988). Gibbons and Strom (1988) note that the difference between the two is a matter of intensity of involvement and conclude that "in practice birders and birdwatchers are the same."

History of Birdwatching in North America

Birdwatching began with the arrival of the European settlers in the 1600's. Artists such as John James Audubon, Alexander Wilson, and William Bartram provided the first artists works of the bird species of North America (Kastner, 1986).

Kastner (1986) distinguished three recognizable time periods in the history of North American birdwatching. The first period (1858 - 1885), begun by Spencer Fullerton Baird, was concerned with ornithological study, collection, and documentation of species. During this period birdwatching was formally organized. The first American organization (Nuttall Ornithological Club) devoted to the study and watching of birds was established and the first key that simplified species identification (Key to the Birds of North America) was published.

The second period (1886 - 1933) is characterized by the first bird conservation and protection efforts. The Audubon Society was established for the primary purpose of bird protection and campaigned for the Lacey Act of 1900, the first federal law for bird protection. Women played a major role in birdwatching for the first time when a group of women founded the Massachusetts Audubon Society to fight the slaughter of birds for millinery. This period saw several states bring in protective legislation and the establishment of 53 bird sanctuaries in the United States. It was during this time that the conservation aspect of birdwatching became apparent through birdwatchers' ability to influence political decisions.

The third period (1934 - present) is characterized by the popularization of the bird field guide by Roger Tory Peterson. First published in 1934, the guide provided an easy means to identify species.

The "Peterson System" of field marks, coloured plates, and range maps has made the world of birds accessible to the most amateur birder. Field guides published since the advent of the "Peterson System" have followed Peterson's concept of using field marks for identification.

History of Birdwatching in Alberta

The history of birdwatching in Alberta follows a similar course as the development for North America with initial concern devoted to ornithological study, collection, and documentation of species. McGillivray (1992) provides an overview of the history of ornithology in the province from which this summary was taken. Data collection began as a byproduct of exploration and trade by European settlers. The first accounts of bird life in Alberta were by Anthony Hendee, the first European to arrive in the province. He made observations of birds during 1754-1755. Subsequently, other explorers such as Samuel Hearne and Alexander Mackenzie travelled through Alberta for the Hudson Bay Company and North West Company keeping records of birds.

The expeditions of Sir John Franklin were the first scientific expeditions into the province that collected bird specimens and their resulting observations formed the basis for the publication Fauna Boreali-Americana. Spencer Fullerton Baird sent Robert Kennicott to Alberta in 1859 to collect specimens for the Smithsonian Institute. The next significant contribution since the Franklin expeditions was by John Macoun, between 1875-1880. His ornithological observations were incorporated in Manitoba and the Great North-west, published in 1883.

Exploration work continued to be the main contributor to ornithological information in the province during the 1880's and into the early 1900's with the Geological Survey of Canada sending survey parties to Alberta that included ornithologists. A Catalogue of Canadian Birds, the first Canadian book devoted entirely to birds, was published in 1887 and included the birds of Alberta.

Ornithological work proliferated in Alberta after 1900 with the Geological Survey of Canada work in northern Alberta and national parks, museum collections, publication of local natural history studies, and work at the University of Alberta.

The end of the early phase of Alberta ornithology occurs with the publication of the Birds of Alberta by Salk and Wilk in 1958 which documented bird distributions in the province. The establishment of birdwatching as a recreational activity in the province is evidenced in the founding of the Edmonton Bird Club in 1949. It continues to be the only club in the province dedicated exclusively to birdwatching. Subsequently, several natural history societies have been established which are also involved in recreational aspects of birdwatching.

The modern day expansion of birdwatching in Alberta is marked by the notable change in participation of volunteer ornithologists in large data collection projects such as the Christmas Bird Count, Breeding Bird Surveys and the publication of the Atlas of Breeding Birds of Alberta in 1992. The Atlas of Breeding Birds represents the culmination of professional and amateur ornithological work in the province. It is the most comprehensive publication to date, providing the first systematic assessment of the breeding bird distributions of Alberta and the first comprehensive electronic data base of bird distributions in the province. The involvement of over 900 volunteers contributing about 40,000 hours of field work is testimony to the increased interest in birds and birdwatching in the province.

Birdwatcher Studies

Studies in nonconsumptive wildlife-related recreation have been concerned primarily with activities such as residential wildlife viewing, wildlife viewing trips, or incidental encounters with wildlife (Filion et al., 1993; U.S. Fish & Wildl. Serv., 1988). Few studies have examined specific nonconsumptive user groups of wildlife such as birdwatchers. Studies on birdwatchers have been primarily of users at specific locations (Applegate & Clark, 1987; Applegate et al., 1982; Butler & Fenton, 1987; Hvenegaard et al., 1989) or engaged in special events (Boxall & McFarlane, 1993; Boxall et al., 1991; Wiedner & Kerlinger, 1990). However, it is evident from these studies that subgroups of birders can be distinguished based on birdwatching experience.

Applegate et al. (1982) classified birders at a National Wildlife Refuge based on behavior, knowledge, and equipment. Level of involvement was reflected in four distinct subgroups: nonbirder,

fair birder, good birder, and excellent birder. Almost half (48%) were classified as nonbirders spending the least time and having the lowest knowledge scores. Only 21 percent were classified as good or excellent birders. The study suggested that subgroups with differing levels of birding competence have different management requirements, particularly in the supply of information on species and natural history. Using the same classification scheme, Applegate and Clark (1987) found that competent birders reported lower satisfaction ratings than their less competent counterparts. These differences in satisfaction could be due to competent birders having very specific goals, such as adding species to a list, whereas, less sophisticated birders may simply want to see birds. A second explanation for differences in satisfaction may be expectations and preferences. Competent birders expect prefer many species and prefer to see less common birds while the less sophisticated birders may prefer large numbers of conspicuous individuals. They concluded that differences in birding competence have implications for managers trying to deliver quality wildlife viewing opportunities. A variety of management options may be required to provide the opportunity for satisfying birding experiences.

Kellert (1985) distinguished between casual and committed birdwatchers based on the number of species they could identify. Casual birdwatchers were identified as those who could identify ≤10 species without the aid of a field guide, and committed birders were those who could identify ≥40 species. Casual birders represented 25% of a national survey in the United States, and about three percent of respondents were classified as committed birders. Differences in reasons for birding, demographic characteristics, knowledge and attitudes to animals, and support for funding wildlife management were observed between the two categories. Committed birdwatchers cited a personal fascination with birds as the most frequent reason for birding. Casual birders indicated aesthetic qualities of birds as their primary reason for birdwatching. Committed birders were better educated with higher incomes than nonbirders. Animal related knowledge scores were highest among committed birders than any other activity or social demographic group studied. Attitude profiles of committed birders indicated they were concerned and interested in wildlife and the environment. The attitude and knowledge scores suggest that active birding can promote an understanding, awareness, and concern for

wildlife and the natural environment. Committed birders strongly supported new methods of funding wildlife conservation and management and 14% belonged to private nonprofit conservation organizations, suggesting this group could be a source of support for wildlife conservation programs.

Based on observations of birdwatchers at Point Pelee National Park in Ontario, Butler and Fenton (1987) identified several birder subtypologies. They included hard listers (primary goal is to observe as many new species as possible), affective watchers (those who view birds for their aesthetic qualities), advanced watchers (those who view or record bird activities such as behavior, food habits, etc.), family birdwatchers (birding is a means to strengthen family ties), courtship birdwatchers (birding is part of a courtship pattern where birding is of secondary importance to participation), photographers (can be divided further based on objectives and approach), and social birdwatchers (primary purpose is to be with others who share their interest). Fenton (1988:115-116) found that more experienced birders were more sensitive to crowding conditions than less experienced birders.

Boxall et al. (1991) found a range of birding experience among Christmas Bird Count participants in Alberta. Self-rated expertise indicated a range from casual (very rarely watch birds or not really interested) to advanced birders, with 7% of participants being casual, 46% novice birders, 36% intermediate, and 11% advanced birders. Expertise ranged from the ability to identify less than 10 species to identifying over 200 without using a field guide. The subgroups differed on reasons for participating, involvement in wildlife conservation, types of birding activities, and frequency of involvement in wildlife-related recreational activities.

These studies indicate that birders represent a variety of recreational opportunity needs and that experience in birding may be used to differentiate birders. Despite the popularity of the activity and the recognition of differences in intensity of involvement the recreational needs of participants are still poorly understood (Butler & Fenton, 1987; Kellert, 1985).

Recreation Specialization

One means of understanding the management needs of a recreational group engaging in the same activity is to differentiate users into segments or subgroups seeking different recreational experiences (Manning, 1986). A method that has proven useful in this regard is the amount and extent of participation an individual has with a particular activity or in a particular setting (Williams, 1988). Several different methods have been used to differentiate users based upon a single item measure of past experience or more elaborate multi-item measures that combine variables to measure several dimensions of experience. Some of the more popular concepts used to segment participants based on activity experience include experience use history (EUH), indexes of past experience, and specialization (Watson & Niccolucci, 1992).

EUH has been used exclusively to segment river floaters. Schreyer, Lime, & Williams (1984) developed a classification scheme based on total river trips, number of rivers run, and number of trips on the study river. The six category scale ranged from "novices" (first time river floaters) to "veterans" (a large amount of experience on several rivers). The EUH system has been useful as an indicator of differences in on-site behaviors, conflicts between users, attitudes to management intervention, motivations, and motivational structures (Schreyer et al., 1984; Williams, Schreyer, & Knopf, 1990).

Hammit and McDonald (1983) developed a similar measure of on-site experience for river floaters using an index of past experience. Years and frequency of floating on all rivers and the study river were combined to create a scale of low, medium, and high experience. More experienced users were more sensitive to resource disturbance and supported management intervention to control impacts. However, more experienced users were less supportive than inexperienced users of regulatory controls of behavior, facility development, and user services. Hammit, Knauf, and Noe (1989) created a similar experience index to categorize horseback riders based on years and frequency of experience. The scale was significantly related to visitor preferences for facilities and services.

Specialization is another means of determining the amount of experience in a recreational activity. Whereas EUH and indexes of past experience measure only level of experience, the level of

past experience is only one component used in the measure of specialization. The specialization framework is usually measured as a multidimensional construct incorporating dimensions such as past experience in the activity, commitment to the activity, and how central the activity is to an individual's life.

Bryan (1977) first proposed the concept of recreational specialization and defined it as "a continuum of behavior from the general to the particular, reflected by equipment and skills used in the sport and activity setting preferences". He used a developmental approach to describe involvement in a recreational activity whereby most individuals move from low to high specialization over time, accompanied by increasing commitment to the activity. Individuals can be arranged along a continuum of experience and commitment from a general interest in the activity to specialists who are highly committed to the activity and have distinct resource preferences and behavior. Using past experience and preferences for settings and techniques, Bryan developed a typology of anglers ranging from the occasional fishermen, generalists, and technique specialists, to the technique-setting specialists. The occasional fishermen represent those who fish infrequently and for whom fishing is not an established part of their leisure time. Technique-setting specialists, on the other hand, are highly committed, specialize in a method of fishing, and have distinct resource preferences.

Bryan (1977) developed four propositions for the specialization theory:

1. Participants tend to go through a predictable syndrome of experiences moving into more specialized stages over time. This is characterized by an increasing commitment to the activity.
2. Specialists within an activity join a leisure social world that sets the standards of behaviour, values and attitudes for the activity.
3. As specialization increases, attitudes shift to preservation and the setting of the activity. The experience of the activity becomes an end in itself.
4. As specialization increases, resource dependency increases, allowing the determination between luck and skill.

Bryan (1979) hypothesized that specialization could be applied to most recreational activities and proposed a conceptual framework of involvement in birdwatching with beginners, listers or "twitchers", and advanced birders arranged from low to high specialization. The beginner birder is primarily concerned with species identification and maintaining a list of species seen. The lister stage emphasizes the number of birds on a life list and involves competitive aspects such as the number of species seen in a day. As specialization increases, emphasis is placed on knowledge of bird behavior and habitat. Because of these differences, conflicts within the activity may occur. The specialized birders with their sensitivity to ecological concerns may be in conflict with the more achievement oriented behavior of listers who may destroy the habitat or the very bird they want to see. This conceptual framework for birdwatching has not been tested empirically.

Components of the Specialization Measure

Bryan's (1977) initial work on anglers placed an emphasis on observable items such as equipment. Since then studies have broadened the concept to include other dimensions such as past experience, commitment to the activity, and centrality of the activity to an individual's life. These dimensions are usually quantified using an index and summed to create a measure arranging individuals on a continuum of experience. Many studies have combined multidimensional measures of specialization to explain differences among recreationists, but the concept has not been measured consistently. There is no agreement on what measures define the dimensions (Kuentzel & McDonald, 1992) and little theoretical support for the dimensions used to represent the concept of specialization (Watson & Niccolucci, 1992).

Bryan (1977) suggested that commitment to a recreational activity is a critical dimension of specialization. Using results from sociological and psychological research, Buchanan (1985) discussed the theoretical components of committed behavior of recreationists. He conceptualized commitment as a process occurring along a continuum and defined committed behavior as "the pledging or binding of an

individual to behavioral acts which result in some degree of affective attachment to the behavior or to the role associated with the behavior and which produce side bets as a result of that behavior."

Buchanan (1985) identified three major components necessary for the existence of committed behavior and the measure of specialization. First, commitment requires consistent or focused behavior and implies a rejection of alternative behaviors. This includes behavior that has persisted over time and a willingness to devote time and effort to the activity. Second, commitment is a function of side bets. Side bets represent the investments which have resulted from participation. Side bets include time necessary to develop knowledge and skills, financial resources to invest in the activity, and friendships developed in connection with participation. Third, commitment involves affective attachment to the goals and values of a role, an activity, or an organization. Three general categories of the affective component include a stronger affect for the current activity than for alternatives (continuance), affective attachment to other participants (cohesion), and dedication to, and acceptance of, the norms and values of the principal actors within a social network (control).

Buchanan (1985) indicated that relying on only observables such as equipment may not reflect an individual's commitment to an activity and hence their degree of specialization. He suggested that specialization measures should indicate a measure of past experience, centrality of participation to lifestyle, and the degree of investment in a particular activity. Variables measuring these dimensions will relate to the definition of commitment and include behavioral consistency, some degree of affective attachment, and the existence of side bets. He concluded that in combination these three components "appear to tap the main attributes of committed behavior".

Selin and Howard (1988) used the social psychological concept of ego-involvement to develop a theoretical explanation for the affective attachments individuals have for recreational activities. Ego-involvement is a state of identification between an individual and a recreational activity characterized by enjoyment and self-expression achieved from the activity. Individuals can be arranged along a continuum from low to high ego-involvement within a recreational activity. The ego-involvement concept is similar to the affective component of commitment identified by Buchanan; it cannot be

measured using behavioral indicators but must be inferred from the presence or absence of its subcomponents (Selin & Howard, 1988). Selin and Howard (1988) identified five subcomponents necessary for ego-involvement to occur: centrality of the activity to an individual's personal values, the importance of the activity to the individual, enjoyment or expressive rewards from the activity, an abiding interest in the activity, and expression of individuality through the activity.

McIntyre and Pigram (1992) treated ego-involvement as synonymous with commitment. They applied the concept of ego-involvement or commitment to a recreational activity by adapting a model of product involvement from consumer behavior research. They propose a three component specialization loop of cognitive, behavioral, and affective systems. The behavioral system consists of prior experience with the activity and the cognitive system relates to the knowledge and skills accumulated about the activity and the equipment associated with participation. The affective system relates to ego-involvement and consists of a multidimensional measure termed enduring involvement (McIntyre, 1989). Using vehicle based campers, they identified three dimensions to the affective component: attraction, which includes items relating to enjoyment and importance of participation; self-expression, which allows for freedom from constraints of normal life; and centrality, which includes social interaction and the role of the activity in the individual's life. In the affective system, the centrality-to-lifestyle component was the most useful component in predicting the choice of recreation settings among campers (McIntyre, 1989).

Specialization Studies

Recreation specialization has proven useful in providing resource and visitor management guidelines by differentiating participants in an outdoor recreational activity. Differences in attitudes and behavior patterns among levels of specialized individuals have provided guidelines for resource and visitor management in outdoor recreation settings (Williams, 1988).

Studies using the single dimension of past experience in an activity have shown differences in motives for participating (Schreyer et al., 1984; Williams et al., 1990), with more experienced users

expressing a sense of achievement, self-worth, or personal meaning. More experienced users are less tolerant of facility and service development (Hammit & McDonald, 1983; Hammit et al., 1989; Schreyer et al., 1984) and regulatory controls (Hammit & McDonald, 1983), are more sensitive to crowding (Graefe, Donnelly, & Vaske, 1986; Schreyer, et al., 1984; Vaske, Donnelly, & Heberlein, 1980) and resource disturbance (Hammit & McDonald, 1983), and differ in environmental preference (Schreyer & Lime, 1984; Schreyer & Beaulieu, 1986).

Studies using composite indexes of specialization dimensions such as past experience, commitment, and centrality-to-lifestyle have shown differences among specialization levels. More specialized individuals tend to prefer less management intervention (Bryan, 1977; Chipman & Helfrich, 1988; McIntyre & Pigram, 1992; Virden & Schreyer, 1988), are more sensitive to crowding (Virden & Schreyer, 1988), and differ in motives for participating (Chipman & Helfrich, 1988; Kaufman & Graefe, 1984) and in environmental preferences (Bryan, 1979; Virden & Schreyer, 1988; Williams & Huffman, 1986).

Discussion

This review indicates that birdwatching has a long history in North America and began with documenting species and collecting specimens. The advent of lightweight binoculars and easy-to-use pocket field guides revolutionized birding as a recreational activity, making it accessible to virtually anyone who had an interest in the activity. The accessibility of birding has contributed to its popularity today. However, despite its popularity, few studies have been directed specifically at understanding the recreational and wildlife management needs of this group.

Bryan (1979) proposed that the concept of recreation specialization could be applied to birdwatching and developed a continuum of birding experience from the beginner to the advanced participant. Birdwatchers have been shown to represent a range of birding expertise and involvement (e.g., Applegate et al., 1982; Boxall et al., 1991), suggesting the activity may be studied using the

framework of recreation specialization. However, Bryan's conceptual framework for birdwatching has not been tested empirically. This thesis uses Bryan's (1979) theory of specialization and incorporates Buchanan's (1985) measures of committed behavior (past experience, centrality-to-lifestyle, and economic committment) to test the theory of specialization among a sample of birdwatchers. Specialization is used to develop typologies of birders, differentiate motivations and influences of socialization in birding, and to examine the relationship between involvement in birdwatching, attitudes toward wildlife, and involvement in wildlife conservation.

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Chapter II

Paper I. Application of the Recreation Specialization Framework in Birdwatching

Introduction

Classifying recreationists based on activities (e.g., fishing, hunting, birdwatching, camping) is inadequate because within an activity there may be several subgroups or typologies seeking different types of recreational experiences (Driver & Tocher, 1970). The diversity among participants in outdoor recreational activities has been recognized in regard to socioeconomic characteristics, attitudes, preferences for services and facilities, perceptions of crowding, and motivations for participation (Manning, 1986). To provide wildlife viewing opportunities to the nonconsumptive wildlife user, the diversity in viewing interests must be recognized (Manfredo & Larson, 1993). Several classification schemes have been used to distinguish the diversity of participants in nonconsumptive wildlife-related recreation which have guided management for a diversity of user types (Applegate, Otto, & Buttitta, 1982; Lyons, 1982; Manfredo & Larson, 1993). However, this approach for the planning and management of recreation opportunities for birdwatchers is generally lacking.

Despite the popularity of birdwatching, birders are still a poorly understood group of nonconsumptive wildlife users (Butler & Fenton, 1987; Kellert, 1985). Few studies have been conducted specifically on birdwatchers. Of these, most have concentrated on specific locations or special events and have generally reported on specific management issues or summary statistics. Some studies suggest that birders represent a diversity of recreational and wildlife management needs and that the amount of experience an individual has in birdwatching may be one means of exploring this diversity (Applegate, Otto, & Buttitta, 1982; Boxall, Stelfox, & Hvenegaard, 1991; Butler & Fenton, 1987; Kellert, 1985).

Introduced by Bryan in 1977, recreation specialization as a classification scheme has been applied to several activities including fishing (Bryan, 1977; Chipman & Helfrich, 1988), camping

(McIntyre & Pigram, 1992), and backpacking (Virden & Schreyer, 1988; Williams & Huffman, 1986). Specialization theory predicts that participation in a recreational activity progresses through a sequence of developmental stages from low to high specialization. Individuals are arranged along a continuum of experience and commitment from a general interest in the activity to specialists who are highly committed to the activity. Each level of specialization represents a stage with distinct resource orientations, level of commitment to the activity, behavior, values and attitudes, motivations for participating, and social orientations (Bryan, 1979). Bryan proposed that specialization could be applied to most recreational activities and developed a conceptual framework for birdwatching with beginners, listers or "twitchers', and advanced birders arranged from low to high specialization. This conceptual framework has not been tested empirically. This study uses Bryan's (1979) theory of specialization in birdwatching and incorporates Buchanan's (1985) measures of committed behavior (past experience, centrality-to-lifestyle, and economic investment) to test the theory of recreation specialization among a sample of birdwatchers.

Given the need for and lack of information currently available on specific groups of nonconsumptive wildlife users, this paper is directed towards developing a typology of birdwatchers based on the theory of recreation specialization. The objectives are to apply the specialization construct to birdwatching and to segment birdwatchers into distinct groups based on the specialization framework. Research methods common to all papers in the study are presented and the socioeconomic and birdwatching characteristics of the sample are examined.

Methods

Survey Methods

Sample and Sampling Techniques

The sample was not intented to be representative of all birdwatchers in Alberta. The sampling procedures used were based upon the need to gather data from birdwatchers that represented a range of birdwatching expertise to test various aspects of recreation specialization in birdwatching. This

consideration, along with the recognition that the population of birdwatchers is not easily defined, guided the selection and development of data gathering techniques. The population of birdwatchers is not easily identified because their activities are not licensed, there are few programs designed specifically for them, their activities do not require the use of specialized recreation areas or facilities, and there is a lack of specific sponsorship by industry. Because a general population sample would probably yield proportionately few persons with any birdwatching experience, a sampling strategy was used that would likely represent birdwatchers with a range of birding expertise.

It is not unusual in specialization research to target specific samples to ensure that a range of experience is represented (e.g., Wellman, Roggenbuck, & Smith 1982; Schreyer & Beaulieu, 1986). That was the approach taken in this study. A nonprobability sample was drawn from the 1991 mailing lists of all natural history societies in the province, the only bird observatory, the only birdwatching club in the province, and participants in the Edmonton Christmas Bird Count. Appendix I presents a list of the organizations from which the sample was drawn. The Edmonton Christmas Bird Count was included because it attracts people with a wide range of birding experience (Boxall et al., 1991). Christmas Bird Counts have traditionally involved dedicated birdwatchers organized by naturalists' organizations. However, in Edmonton participants are recruited by extensive media promotion and advertising. Since 1987, the city has attracted the largest number of participants of any count in North America (Boxall et al., 1991). Participants in the Edmonton Christmas Bird Count differ from count participants following the traditional organizational methods, in that many participants are less experienced and less committed to birding (Boxall & McFarlane, 1993).

Sample size was determined based on the need to obtain adequate numbers for statistical comparisons, at a 95% confidence interval, among specialization levels. A sample size of 1,000 was determined based on the minimum proportion of respondents expected within a specialization level (0.07) and an assumed response rate of 60% (Boxall et al., 1991). A sample of 1,014 was obtained from the mailing lists.

Only individuals with an Alberta mailing address were included from the mailing lists. To prevent duplicates from occurring, mailing lists were cross checked whenever possible. A total of 2,028 names was obtained. A sample was selected by drawing every second individual from the organizations' mailing lists, resulting in a total of 1,014 individuals.

One concern with sampling organizations and special events is that only the more advanced birdwatchers are included, representing the upper end of the specialization continuum and excluding those at the lower end. Therefore, in addition to the mailing lists, 51 patrons of a retail store specializing in birdwatching supplies were sampled during January and February, 1992 to include birders who might not belong to one of the sampled organizations or participate in organized birding activities.

Mail Questionnaire

A self-administered mail questionnaire was developed for this study. This approach was selected from various alternative methods of data collection because of its appropriateness for effective results. Dillman (1983) describes the advantages and disadvantages of mail questionnaires. There are several advantages to using a mail questionnaire for this study rather than techniques such as telephone interviews. The mail questionnaire provides a relatively inexpensive means of reaching people in several geographical locations. The questionnaire can be completed at the respondent's convenience and can ensure anonymity of the respondent. There is less likelihood of respondents giving socially desirable answers and a greater likelihood of answering sensitive questions such as income. The mail questionnaire can ask more questions, seek more detail, and is better for lengthy questions such as attitudinal and motivational scales than telephone interviews. The potential disadvantages of a mail questionnaire include: the inability to clarify questions or probe the respondent for incomplete answers; the inability to control the number of people that have input to the questionnaire; the inability to ensure that the questionnaire is answered by the individual to whom it is addressed; and the inability to control the order in which questions are answered by respondents.

The questionnaire was developed to collect information on birding specialization variables, motives for birding, attitudes toward wildlife, involvement in wildlife conservation, social aspects of birding, birdwatching history, preferences for the development and management of birding sites, and socioeconomic information (Appendix III).

Development of the questionnaire was based on a review of the literature and preliminary, partially structured interviews with 20 key informants using methods for qualitative interviewing described by Patton (1990). Key informants are people who are particularly knowledgeable and serve as a source of information and insight on the topic under study (Patton, 1990:263-264). Information collected from the interviews helped identify the variables for inclusion in the mail questionnaire.

Key informants for the study were identified by asking four expert birders familiar with the birdwatching community of Edmonton to identify individuals whom they considered to be avid birders. The experts consisted of organizers of the Edmonton Christmas Bird Count and executive members of the Edmonton Natural History Club. Individuals who were identified by more than one expert were selected for interviewing.

Key informants were contacted by telephone to determine their willingness to participate in the study and arrange an interview time, and a follow-up letter was sent in confirmation. The questions used as a guide during the interview were sent with the letter at least one week in advance. Interviews lasted approximately one hour and were taped, with the consent of the interviewee. A self-administered written questionnaire was given to each informant at the conclusion of the interview to test questions for inclusion in the mail questionnaire. Informants completed the questionnaire at their convenience and returned it in a self-addressed, stamped envelope.

The mail questionnaire was designed using the Total Design Method (Dillman, 1978). The questionnaire was printed in a booklet format on white paper. The first page contained the title of the study, an illustration, instructions to the respondent, and affiliation of the study. No questions appeared on the first or last pages; potentially objectionable questions were placed later in the questionnaire, and demographic information was last. The first question applied to everyone and was easy to answer.

Whenever possible, questions were not split between pages. Transition statements were used to warn of changes in topic and visual cues such as arrows, indentations, and spacing were used to provide direction. Illustrations were used throughout to prevent visual monotony and to avoid large blank spaces. The questionnaire primarily used closed-ended or fill-in-the-blank questions. A one-page cover letter on University of Alberta letterhead explaining the purpose of the survey, why each response was important, and assuring anonymity of the respondent was included (Appendix IV). The cover letter included a request for respondents to return only one questionnaire in the event they had received more than one. A business reply envelope was enclosed for returning the questionnaire.

The mail questionnaire was pretested on 13 individuals chosen to represent a range of birding experience. Additional comments were sought from professionals familiar with questionnaire design. Minor changes were made to the wording and order of questions.

Questionnaires were mailed in January, 1992, to the 1,014 individuals selected from the mailing lists. Two of the natural history clubs have a policy of not releasing their membership lists and were concerned about retaining the anonymity of their members. These clubs were instructed on how to draw the sample and attached mailing labels to the questionnaires without releasing the members' names. Ten days after mailing, a follow-up postcard was sent, encouraging people to complete the questionnaire. Because of the concern for anonymity among some suppliers of mailing lists and reliance on two clubs to prepare the mailing labels, respondents were not identified. A list of respondent's names was not maintained and further follow-up was not possible without considerable expense.

At the retail outlet, 51 questionnaires were distributed by store staff at their convenience and discretion. Questionnaires were completed at the convenience of the respondent and returned by mail.

Data Processing and Analysis

A codebook was developed to summarize questions, data formats, and coded responses (Appendix II). The data were cleaned using checks for duplicate records, missing cards, and values within acceptable ranges for each variable (Karweit & Meyers, 1983:392-397).

Likert scales (ordinal data) were treated as interval data in analysis. It has been shown that this does not lead to erroneous conclusions in general and statistics at the interval level give more information about the data than statistics at the ordinal level (Borgatta & Bohrnstedt 1981; Gregoire & Driver 1987; Kim, 1975; Lutz 1983). Missing data were replaced, where appropriate, with the group-specific means of each birdwatching specialization cluster (Anderson, Basilevsky, & Hum, 1983:457).

Data were analyzed using the SAS statistical package release 6.06 (SAS Institute Inc., 1989). Descriptive statistics (univariate analyses) were used to initially organize and understand each variable and its frequency distribution. To examine bivariate associations, chi-square tests were conducted to examine relationships between selected variables with nominal measurement. One-way analysis of variance (ANOVA) and t-tests were used to discover relationships between selected variables when the dependent variable was measured at the ordinal or ratio level. Other statistical tests used to test hypotheses are described in the accompanying sections.

A significance level of 0.05 or less was used as a limit for accepting or rejecting hypotheses. The 0.01 level is ordinarily used where there is little uncertainty and the 0.10 level is restricted to use in very exploratory studies which have a high degree of uncertainty surrounding their theory and methods (Labovitz, 1968; Lutz, 1983).

Nonresponse Bias

Nonresponse bias has been identified as a source of bias from self-reported surveys (Tarrant & Manfredo, 1993). Nonresponse bias occurs when respondents of a survey differ on survey items from those who do not respond.

Studies examining the effects of nonresponse bias have shown that nonrespondents differ on socioeconomic and attitudinal variables and have lower participation rates or do not participate in the recreational activities being studied (Brown & Wilkins, 1978). However, among homogenous populations, little or no differences have been found between respondents and nonrespondents and the need for extensive and costly follow-up procedures has been questioned (Becker, Dottavio, & Mengak,

1987; Becker & Iliff, 1983; Dolsen & Machlis, 1991; Hammitt & McDonald, 1982; Wellman, Hawk, Roggenbuck, & Buhyoff, 1980). Homogenous populations in mail surveys include people engaging in a specific recreational activity at a specific location (Becker et al., 1987), people with a common interest (Becker & Iliff, 1983), and people who have a strong group identity (Leslie, 1972).

The most common method of determining nonresponse bias in mail questionnaires is by contacting nonrespondents using a follow-up telephone interview (Woodside & Ronkainen, 1984). In this study, it was not possible to obtain telephone numbers for most of the sample. Therefore, nonrespondents could not be contacted for a direct comparison with respondents. Comparing different wave respondents has been shown to be a reasonable substitute for examining nonresponse bias based on the assumption that nonrespondents are more like late respondents than early respondents (Henry, 1990:132; Wellman et al., 1980). Nonresponse bias in this study was examined by comparing early, middle, and late respondents to the mail survey on selected demographic, wildlife conservation, and birdwatching variables.

Respondents were divided into early, middle, and late respondents based on the date of return of the completed questionnaire. Early respondents were those who responded within one week; middle respondents between one to three weeks; and late respondents after three weeks of the initial mailing. Respondents from the mailing list were also compared on selected variables with respondents from the retail outlet to determine if these samples differed.

Recreation Specialization

The Specialization Measure

Eleven variables were chosen to measure the specialization construct (Table II.1) (Wellman et al., 1982; Virden & Schreyer, 1988) based on the hypothesized dimensions of past experience, commitment, and centrality to lifestyle (Bryan, 1979; Buchanan, 1985; McIntyre & Pigram, 1992). Variables were standardized to a mean of 0 and standard deviation of 1 to account for the different metrics.

Principal components factor analysis with varimax rotation was used to extract the specialization components. The use of principal components is recommended as a procedure for identifying the underlying components of specialization (Watson & Niccolucci, 1992). Components were extracted until the eigenvalue fell below 1.0. The eigenvalue measures the variance accounted for by a factor. Since the variance of a variable is 1.0, the cutoff rejects factors that do not account for at least the variance of one variable (Rummel, 1970). A minimum loading of 0.30 was used to identify variables belonging to a component (Gorsuch, 1983:184-186). Separate scores were calculated for each component by adding the standardized item responses. Scale reliability was checked using Cronbach's alpha.

Cronbach's alpha is a measure of internal consistency. It indicates the extent to which items on a scale are measuring a common entity (Carmines & Zeller, 1979:43-47). Nunnally (1978:245) indicates that for basic research such as hypothesized measures of a construct, a Cronbach's alpha ≥ 0.70 is a reasonable indication of reliability.

Most specialization research has combined the specialization dimensions into a unidimensional scale using a summed index. Variables representing dimensions of the specialization construct are standardized and added to create an index from low to high specialization. McIntyre and Pigram (1992) note that the specialization index has been treated as a continuous variable, divided using statistics such as interquartile range and the median, and given designations of low, moderate, and high specialization. This approach creates a continuum as described by Bryan (1979), ranging from low to high specialization. However, the use of a unidimensional summed index assumes that each dimension increases at the same rate and in the same direction over time: as an individual gains more experience, they also become equally more committed and the activity becomes more central to their life (Kuentzel & McDonald, 1992). A continuum of specialization represented by a summed index has had mixed results in explaining differences among subgroups of recreationists. This has been attributed to the fact that such an approach does not consider the variation in the individual specialization components (McIntyre & Pigram, 1992). Studies have shown that specialization dimensions have differential effects

on items such as an individual's motives, management preferences, and evaluations of crowding (Schreyer & Beaulieu, 1986; Kuentzel & McDonald, 1992; Kuentzel & Heberlein, 1992) and that each dimension does not necessarily increase in a linear fashion over time (Kuentzel & McDonald, 1992). The multidimensional nature of specialization can be recognized by using cluster analysis to develop profiles of participants in an activity (McIntyre & Pigram, 1992) or by treating each dimension as a separate variable (Kuentzel & McDonald, 1992). The development of profiles has been used successfully in describing differences in attitudes toward management among subgroups of campers (McIntyre & Pigram, 1992) and motivations and management preferences of fishermen (Chipman & Helfrich, 1988). Treating each dimension separately provides a means of examining the contribution each dimension makes to the specialization construct and contributes to theoretical considerations of specialization (Kuentzel & McDonald, 1992). This study uses both approaches. Cluster analysis is used to create profiles of birdwatchers. The profiles are used to examine differences across levels of birdwatching specialization. The individual effects of the specialization components are examined to investigate theoretical implications of the specialization construct.

Cluster Analysis

Cluster analysis encompasses a wide variety of procedures that can be used to create a classification of individuals into relatively homogenous groups (Aldenderfer & Blashfield, 1984:17). In this study a disjoint clustering procedure (FASTCLUS procedure, SAS Institute Inc., 1989) was used to create four discrete clusters from the specialization component scores.

FASTCLUS uses an iterative partition method. Initial partition involves the definition of cluster seeds which are estimates of the means of the clusters. Each observation is assigned to the nearest seed. An initial partition of the data is formed by arbitrarily assigning all cases to the clusters. The means of the clusters are calculated. The Euclidean distances are calculated between all observations and the cluster means and observations are assigned to the nearest cluster by minimizing the squared Euclidean distances from the cluster means. When all observations are assigned, cluster

means are calculated again. The procedure of assigning observations to the nearest clusters is repeated until no reassignments occur. Final clusters are formed by assigning all observations to the nearest cluster mean. If the correct number of clusters is specified in the FASTCLUS procedure, then the clusters are formed without iterating.

Iterative clustering methods require the specification of the number of clusters in the data prior to cluster analysis. Criterion for determining the number of clusters was based on previous studies of birdwatchers in Alberta where a four category, self-rated classification system was used to rate birding ability (Boxall et al., 1991). To ensure all clusters would be identified, five clusters were specified in the analysis. The procedure produced four clusters without iteration.

Aldenderfer and Blashfield (1984:46) discuss the advantages and disadvantages of iterative clustering methods. The advantages of an iterative cluster method are that large data sets (n >100) can be clustered much faster and with less expense than other clustering methods such as hierarchical agglomerative methods and that the method produces distinct clusters which are not nested or overlapping. The major disadvantage of iterative procedures is that finding the optimal initial partition from all possible partitions of the data is difficult. For large data sets using several variables in the analysis, it is computationally impossible. Only a small subset of all possible partitions is used to find the optimal partition of the data.

Results

Survey Instrument

Questionnaire Response

A total of 839 mailed questionnaires were returned. Sixty four were returned as undeliverable and 19 were returned but considered unusable, giving 756 useable questionnaires. Adjusting for the undeliverables and unusables, a response rate of 81% was attained. Of the 51 questionnaires distributed through the retail store, 31 were returned giving a response rate of 61% and a total sample of 787.

Nonresponse Bias

Comparisons of early, middle, and late respondents indicated a difference in age distribution between the groups (Table II.2). No differences were found on other demographic variables, specialization dimension scores, or wildlife conservation activities (Tables II.2 & II.3). A difference on one of the many variables used to test for bias, could be due to chance alone. Response bias is often represented by nonrespondents being less involved in the activity, rather than differences in socioeconomic variables (Tarrant & Manfredo, 1993). Based on these results, which show a difference in only one socioeconomic variable, and those of others examining nonresponse bias in homogenous groups (Becker et al., 1987; Becker & Iliff, 1983; Dolsen & Machlis, 1991; Leslie, 1972; Wellman et al., 1980), it was inferred that no substantive difference exists between respondents and nonrespondents of the mail sample. A comparison of respondents from the mailing lists and the retail store respondents showed no differences between these two samples (Tables II.4 & II.5).

Recreation Specialization

Specialization Components

Three components were identified for the specialization construct (Table II.6). A past experience/skill component consisted of days spent on birding outings or trips, farthest distance travelled on outings or trips for the main purpose of birdwatching, self-perceived skill level, personal involvement in birdwatching, and self-rated identification abilities. A centrality-to-lifestyle component consisted of number of species on a life list, number of birdwatching magazine subscriptions, and number of birding books. An economic commitment component consisted of the number of birding equipment items owned and the replacement value of birding equipment. Years of birding experience did not load on any component and was dropped from the analysis. Reliability measures, using Cronbach's alpha, ranged from 0.64 for economic commitment, 0.68 for centrality-to-lifestyle, and 0.75 for past experience/skill.

Birdwatching Clusters

Four subgroups of birdwatchers were identified by cluster analysis on the three specialization components. For ease of presentation and interpretation, the clusters were assigned labels and ordered from low to high specialization as follows: casual, novice, intermediate, and advanced birders. The casual group had the lowest and advanced the highest mean scores on all three components (Figure II.1). Novice and intermediate scored nearly the same on the economic commitment component. However, the intermediate group scored higher on the past experience/skill and centrality-to-lifestyle components. Casual birders comprised 43% of the sample, novices 38%, intermediates 12%, and advanced birders 7%.

No differences occurred between the clusters on education, total household income, or place of residence (Table II.7). A difference occurred in the distribution of women and respondents older than 45 years of age. Over 60% of the casual birders were women, whereas only 37% of the advanced group were. Women appear to be relatively new to birding with 46% having ≤10 years of birding experience compared to 36% of men (χ^2 = 8.46, 1 df, p = 0.0040). Of respondents with ≤5 years of experience, 60% were women. A larger proportion of novice and intermediate birders were >45 years of age.

Consistent with other studies of birdwatchers (e.g., Hvenegaard, Butler, & Krystofiak, 1989; Kellert, 1985), the sample consisted of about an equal proportion of men and women and well-educated, high income, middle-aged individuals: 54% of respondents were women, over 70% had a college or university education, over 30% had a household income >$60,000, and the mean age was 51 years.

Birdwatching expertise of the clusters ranged from those who primarily watch and feed birds around their residence to leaders in the birding community, who take several birdwatching trips in a year and teach others about birds and birdwatching. Table II.8 and Table II.9 present the distribution and means of selected birding specialization variables among the clusters. Generally, the proportion of each cluster participating in various birdwatching activities increased with specialization (Table II.10).

On average, casuals participated in 2.12 birding activities during 1991, novices 3.41, intermediate 4.24, and advanced 5.36 ($F = 133.43$, 3 df, $p = 0.0001$). The clusters are described as follows.

Casual Birders:

Most of this group (57%) have ≤10 years of birdwatching experience and have low identification skills and low involvement in birding. Maintaining a bird feeder and participating in bird census are the predominant activities of this group. Most (88%) can identify ≤40 species without using a field guide and 75% did not take any trips or outings in 1991 for the primary purpose of birding. An average of 0.98 days was spent on birdwatching trips or outings. Six percent of the group do not own birding books and of those who do, 96% own ≤10. Eleven percent do not own birding equipment. On average, this group owns 2.2 equipment items. Seventy-seven percent have equipment valued at ≤$500.

Novice Birders

Thirty-one percent of novice birders have ≤10 years birding experience. The predominant birding activities of novice birders include maintaining a bird feeder, keeping a list of species seen, participating in census, and photographing birds. About 69% of respondents can identify >40 species without using a field guide, but of these, only 19% can identify >100 species. About 39% took birding outings or trips ≤100 km and on average spent about nine days on these outings or trips during 1991. Seventy-five percent own ≤10 books. On average, novice birders own about four equipment items. Sixty percent have equipment valued at >$500.

Intermediate Birders

This group has considerable years of birding experience, with 72% having >10 years. This group is more knowledgeable and more involved than the casual and novice groups. A higher proportion of intermediate birders participate in predominately the same activities as novices. However, many members of this group also attend bird walks, tours, or presentations on birds or birdwatching.

About 91% can identify >40 species without using a guide, and of these, 25% can identify >200 species. About 85% took trips >100 km from their residence and 40% took trips >500 km, spending, on average, 48 days on trips or outings during 1991. About 63% own >10 books. On average, members of this group own about four equipment items. Sixty-two percent value their equipment at >$500.

Advanced Birders

Seventy-seven percent of advanced birders have >10 years of birding experience. This group has considerably more knowledge and is more involved in birding than the other groups. This is the most active group and includes the leaders in the birding community, with over 50% leading bird walks, tours or giving presentations on birds or birdwatching. A large portion of this group documents their activities by keeping species lists, taking notes on bird behavior, photographing birds, and recording bird songs. About 82% can identify >100 species and 57% can identify >200 without using a guide. Ninety- five percent took a birdwatching outing or trip in 1991 with 77% travelling >100 km and 57% travelling >500 km. On average, this group spent 48 days on outings or trips. Ninety-eight percent own more than 10 books and 20% own over 100 books. On average, they own about five equipment items and 93% have birding equipment valued at >$500.

Discussion

Results from the factor analysis of the specialization variables indicate that birdwatching can be represented by the specialization construct. The variables chosen to measure the specialization construct loaded onto three components that correspond to hypothesized specialization dimensions: past experience/skill, which reflects a devotion of time and effort to the activity and aquistion of knowledge and skills; economic commitment, which reflects the investment of financial resources in equipment; centrality-to-lifestyle, which reflects an affective attachment through the acceptance of norms and values by the use of birding media such as books and magazines. These dimensions correspond to Buchanan's

(1985) behavioral consistency, affective attachment, and side bets and McIntyre and Pigram's (1992) behavioral and cognitive components and the centrality component of the affective system.

The specialization dimensions identified for birding correspond to those identified for other recreational activities with one exception. The personal involvement item, which has been associated with centrality-to-lifestyle dimension in other studies (Virden & Schreyer, 1988; Wellman et al., 1982), loaded on the past experience/skill component. The loading of skill and experience variables on the same factor has been found in other studies (Kuentzel & McDonald, 1992; Virden & Schreyer, 1988). The number of magazine subscriptions and books loaded on centrality-to-lifestyle and equipment items loaded on an economic commitment factor as in other studies (Chipman & Helfrich, 1988; Virden & Schreyer, 1988; Wellman et al., 1982). This is the first report of these specialization measures being applied to birdwatching. Reliability coefficients indicate these measures could be improved upon. Including other variables such as better indicators of affective attachment to birding or objective measures of respondent's skill may improve the measure. This study used activity importance relative to lifestyle and other recreational activities as indicators of affective attachment. Other components of affective attachment, such as attraction and self-expression (McIntyre & Pigram, 1992), may provide a better measure of this specialization dimension.

The cluster analysis produced distinct subgroups of birdwatchers, indicating that birdwatchers can be segmented based on the specialization framework. These results provide empirical support for Bryan's (1979) specialization framework for birdwatchers and represents the first indication in the literature that the specialization concept can be applied to nonconsumptive wildlife users. Four distinct subgroups were identified which represented a range of birding expertise and involvement, suggesting that recreation specialization is a useful means of segmenting birdwatchers.

Table II.1. Distribution of Variables Used to Measure Specialization in Birdwatching

Variable	Mean	Std. deviation	Range
Days on birdwatching outings or trips in 1991[a]	12.74	33.62	0 - 365
Furthest distance travelled on outings or trips in 1991[b]	1.79	1.79	0 - 5
Personal involvement[c]	0.63	0.95	0 - 4
Perceived skill level[d]	2.47	0.76	1 - 4
Self-rated identification ability[e]	3.69	1.09	1 - 6
Number of species on life list[f]	47.79	144.64	0 - 1600
Number of birding magazine subscriptions[g]	0.29	0.87	0 - 10
Number of birding books[h]	1.89	1.20	0 - 6
Number of equipment items[i]	3.16	1.76	0 - 11
Equipment replacement value[j]	2.45	1.78	0 - 8

[a] Measured on an open-ended scale. [b] Measured by a 6-category question ranging from 0 to >500 km. [c] Four statements were presented to describe involvement, and the number of statements checked was used as a measure of personal involvement. [d] Self-rated on a 4-category scale of casual, novice, intermediate, and advanced. [e] Self-rated ability to identify species without using a field guide; a 6-category scale ranging from 0 to >200 species. [f] Total number from respondent's life list. [g] Measured by an open-ended question. [h] Measured on a 6-category scale ranging from 0 to >100 books. [i] Measured by an 11-item check list. [j] Measured on a 9-category scale from $0 to >$5000.

Table II.2. Distribution (%) of Demographic Variables Between Early, Middle, and Late Respondents of the Mail Survey.

Variable	Respondents			Statistics	
	Early (n = 202)	Middle (n = 466)	Late (n = 88)	χ^2 value	p
Gender:					
female	50.3	55.8	47.1	3.25	0.197
Income:					
≥$50,000	45.5	45.0	42.1	0.32	0.851
Age:					
>45 years	69.8	60.5	56.8	6.61	0.037

Table II.3. Mean Values of Selected Variables Between Early, Middle, and Late Respondents of the Mail Survey.

Variable	Respondents			ANOVA statistics	
	Early (n = 202)	Middle (n = 466)	Late (n = 88)	F value	p
Conservation activities:					
number of conservation organization memberships	1.68	2.05	1.82	2.64	0.0720
donations ($)	76.56	74.64	39.72	0.81	0.4458
time volunteered (hours)	31.30	41.08	35.25	0.49	0.6145
Specialization component scores:					
past experience/skill	-0.380	0.073	0.272	2.10	0.1235
economic commitment	0.031	-0.039	0.005	0.04	0.9587
centrality-to-lifestyle	-0.236	-0.40	0.108	1.54	0.2147

Table II.4. Distribution (%) of Demographic Variables for Mail Survey and Retail Store Respondents.

Variable	Respondents		Statistics	
	Mail (n = 756)	Retail Store (n = 31)	χ^2 value	p
Gender:				
female	53.4	65.4	1.46	0.228
Income:				
≥$50,000	44.7	53.9	0.84	0.359
Age:				
>45 years	62.6	50.0	1.71	0.191

Table II.5. Mean Values of Selected Variables of Mail Survey and Retail Store Respondents.

Variable	Respondents		Statistics	
	Mail	Retail	t value	p (2-tailed)
	(n = 756)	(n = 31)		
Conservation activities:				
number of conservation organization memberships	1.92	1.39	0.693	0.4947
donations ($)	71.07	74.23	-0.064	0.9492
time volunteered (hours)	37.81	22.42	0.6427	0.5206
Specialization component scores:				
past experience/skill	0.0766	-0.0438	0.6664	0.5054
economic commitment	0.0086	-0.0626	0.1903	0.8491
centrality-to-lifestyle	0.0005	0.0079	-0.0158	0.9874

Table II.6 Principal Components of Variables used to Measure Birdwatching Specialization.

Specialization variables	Principal components		
	Past experience/skill	Centrality-to-lifestyle	Economic commitment
Days on birdwatching outings or trips in 1991	0.78	0.08	0.00
Furthest distance travelled on outings or trips 1991	0.75	0.18	0.21
Personal involvement	0.56	0.29	0.23
Perceived skill level	0.55	0.29	0.23
Identification ability	0.51	0.47	0.25
Number species on life list	0.21	0.80	0.00
Number magazine subscriptions	0.09	0.71	0.30
Number birding books	0.44	0.60	0.22
Number of equipment items	0.15	0.08	0.91
Equipment replacement value	0.20	0.27	0.85
Eigenvalue	4.57	1.16	1.11
Percent variance	41.5	10.5	10.1
Cronbach's alpha	0.75	0.68	0.64

Table II.7. Distribution (%) of Demographic Variables Among Specialization Clusters.

Variable	Specialization Cluster				Statistics	
	Casual (n = 341)	Novice (n =297)	Intermediate (n = 93)	Advanced (n = 56)	χ^2 value	p
Gender:						
female	60.4	51.7	46.2	36.7	15.23	0.002
Education:						
university/ college	74.8	71.7	74.2	85.7	7.36	0.289
Residence:						
urban	81.6	77.1	86.2	78.2	4.30	0.231
Income:						
≥$60,000	33.1	32.7	31.2	39.3	4.85	0.563
Age:						
>45 years	58.9	70.0	71.0	53.6	13.1	0.004

Table II.8. Distribution (%) of Selected Birdwatching Variables Among Specialization Clusters.

Variable	Specialization Cluster				Statistics	
	Casual n=341	Novice n=297	Intermediate n=93	Advanced n=56	χ^2	p
Years of experience:						
>10 years	42.8	68.7	72.0	76.8	61.97	0.000
Identification ability:						
>40 species	11.6	68.6	91.2	100.0	351.87	0.000
Furthest distance travelled on outings or trips in 1991:						
>100 km	3.5	36.4	85.0	76.8	402.72	0.000
Birding books owned:						
>10 books	3.8	24.6	63.4	98.2	311.59	0.000
Equipment replacement value:						
>$500	12.6	60.1	62.2	92.9	213.85	0.000

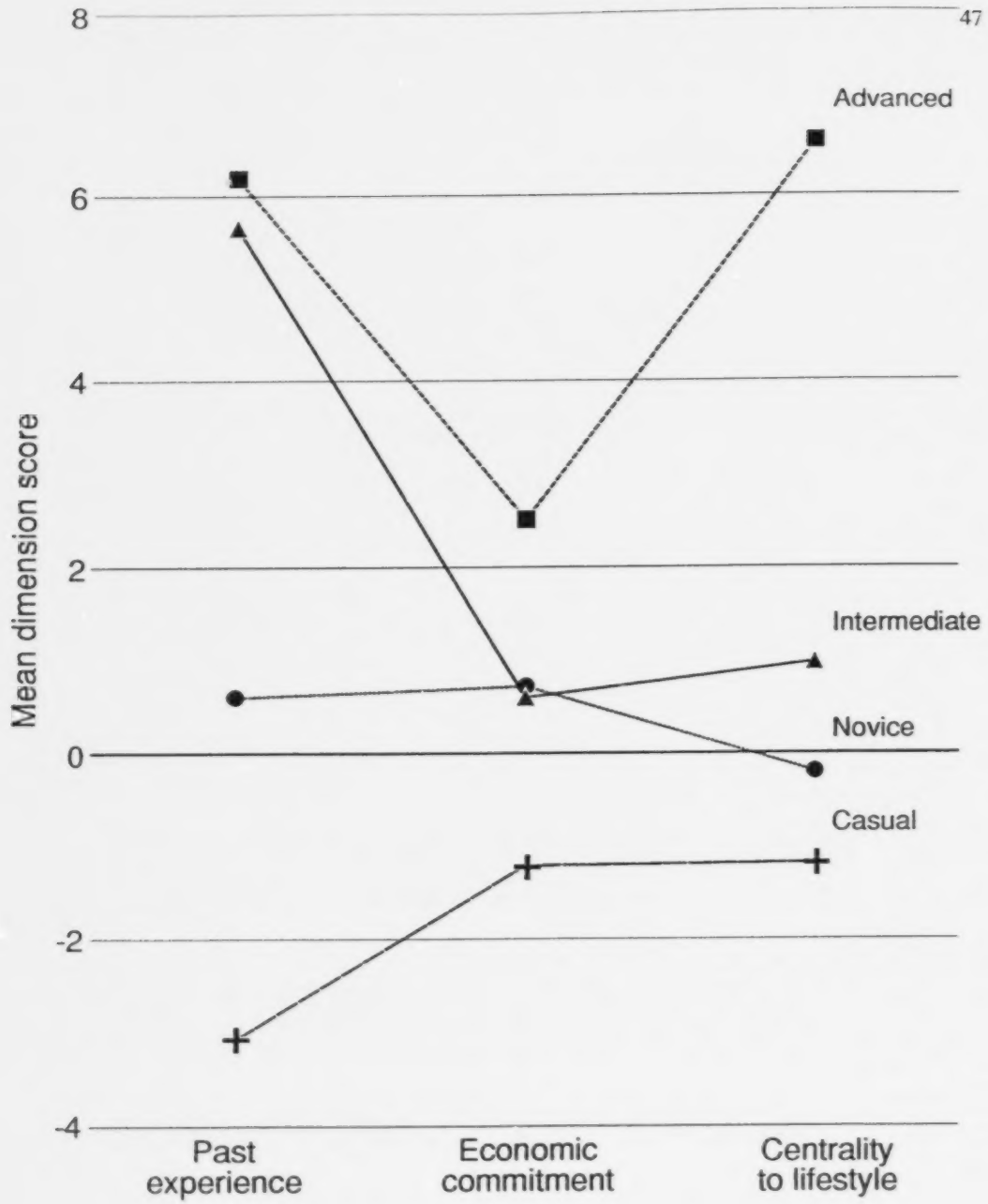
Table II.9. Means of Selected Birdwatching Variables for Specialization Clusters.

Variables	Specialization Clusters				ANOVA	
	Casual	Novice	Intermediate	Advanced	F value	p
	n=341	n=297	n=93	n=56		
Number of equipment items	2.18	3.82	3.58	4.96	96.64	0.0001
Number of magazine subscriptions	0.04	0.16	0.39	2.32	201.73	0.0001
Species on life list	3.29	33.95	65.46	362.82	162.89	0.0001
Days on trips or outings in 1991	0.98	8.60	48.03	47.70	94.67	0.0001
Years of experience	17.46	23.52	26.04	24.54	9.69	0.0001

Table II.10. Distribution (%) of Respondents Participating in Birdwatching Activities During 1991 by Specialization Cluster.

Activities	Specialization Cluster				Statistics	
	Casual	Novice	Intermediate	Advanced	χ^2	p
	n=341	n=297	n=93	n=56		
Maintained a feeder or nest box	81.2	90.2	77.4	89.5	14.94	0.002
Kept a list of species	33.1	55.9	75.3	91.1	104.30	0.000
Kept notes about bird activities	8.8	23.9	46.2	62.5	117.56	0.000
Photographed, drew, or painted birds	24.3	53.2	49.5	66.1	74.60	0.000
Recorded bird songs	1.7[a]		14.8[a]		51.14	0.000
Took part in an organized bird census	41.1	55.9	68.8	78.6	44.48	0.000
Led a birding walk or presentation	2.4	11.5	23.7	55.4	141.10	0.000
Attended a birding walk or presentation	20.2	47.8	72.0	71.4	125.42	0.000

[a] Casual and novice categories, and intermediate and advanced categories were collapsed to allow for sufficient cell frequencies for statistical analysis.



Fiigure II.1 Mean Specialization Dimension Scores for Birdwatching Clusters.

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Chapter III

Paper II. Specialization and Motivations of Birdwatchers[1]

Introduction

Wildlife recreation studies indicate a high level of participation in nonconsumptive wildlife-related recreation (U.S. Fish and Wildl. Serv., 1993; Filion et al., 1992). This level of involvement is expected to continue into the 21st century (Filion et al., 1992). One group that represents a growing number of nonconsumptive participants is birdwatchers (Kelly, 1987:77-78). Because birdwatchers represent a potential economic and political influence for wildlife conservation efforts (Hvenegaard, Butler, & Krystofiak, 1989; Wiedner & Kerlinger, 1990) addressing their needs is important in supplying the attributes necessary for satisfactory wildlife recreation experiences and gaining support for wildlife conservation and management. This paper examines one attribute of the birdwatching experience, i.e., motivations, and discusses implications for developing wildlife recreation programs.

Wildlife management agencies are being challenged to develop products and programs that meet the needs of the nonconsumptive user (Thorne, Brown, & Witter, 1992). Defining the desired product attributes is a useful task in developing specific management and recreation programs tailored to satisfy the nonconsumptive client's demands (Driver, 1985). By understanding the attributes preferred by the nonconsumptive user, products can be defined and differentiated. One aspect of addressing client needs and identifying product attributes is understanding the desired psychological outcomes, satisfactions, or motivations of wildlife recreational activities (Driver, 1985). Understanding motivations for participating in a recreational activity helps differentiate desired products and assists in the planning and management of a variety of preferred experiences (Manning, 1986:79-95). For example, the multiple satisfactions concept of hunting is well documented (e.g., Hendee, 1974; Hautaluoma & Brown, 1978; Decker, Brown, & Gutierrez, 1980) and has provided agencies with information on the

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effectiveness of wildlife management strategies and insights into how to improve the hunting experience (Decker & Connelly, 1989).

Motivations or reasons for participating are the things that cause participation (Crandell, 1980). Driver and his associates were among the first to develop a conceptual foundation for the study of motivations (Manning, 1986:80). They proposed a behavioral approach in which people engage in activities to realize a group of psychological outcomes. People select and participate in recreational activities to meet certain goals. A behavioral approach has been suggested for wildlife-related recreation by using the "multiple satisfactions" approach to hunting (Hendee, 1974).

Whereas the product of a hunting experience has evolved from a "game-bagged" to "days-afield" to a "multiple satisfactions" approach (Decker et al., 1980), a similar evolution from an activity to a behavioral approach of product definition for nonconsumptive users has been slow to occur (Driver, 1985; Thorne et al., 1992). For example, demographics, activities, and expenditures of birdwatchers have been studied at specific locations (Applegate, Otto, & Buttitta, 1982; Applegate & Clark, 1987; Hvenegaard et al., 1989) or while engaged in special events (Witter, Wilson, & Maupin, 1980; Wiedner & Kerlinger, 1990; Boxall & McFarlane, 1993), but little attention has been directed to product attributes such as satisfactions or motivations associated with the birdwatching experience (e.g., Vaske, Donnelly, Heberlein, & Shelby, 1982; Kellert, 1985).

Typically, individuals participate in recreational activities to fulfill a variety of motivations. However, there are usually one or two that are of primary importance for the individual (Manning, 1986:79-95). Decker, Brown, Driver, & Brown (1987) hypothesize that most, but not all, motivations for wildlife-related recreation can be combined into three categories: (1) Affiliative motivations involve social aspects. Participation is primarily to accompany another person and to enjoy their company or to strengthen/reaffirm the personal relationship between them (during the activity or in planning and recalling the activity experiences); (2) Achievement motivations involve meeting some standard of performance. The specific goal could be hunting for meat or trophy (exhibition) or spotting a given species (discovery) to photograph or add to a life list. Sharing accomplishments may or may not be an

important aspect of such involvement; (3) Appreciative motivations involve participating to achieve a sense of peace, belonging, familiarity, and stress reduction.

Decker et al. (1987) proposed a model of wildlife recreation involvement in which participants progress through stages from initiation into the activity to continued participation. A change in motivations occurs over time, shifting from primarily an achievement or affiliative orientation during initial involvement in an activity to primarily an appreciative orientation during continued involvement. Decker and Connelly (1989) verified the existence of affiliative, achievement, and appreciative goals among hunters and concluded that involvement in wildlife recreation is a dynamic process with the primary goal orientation changing as experience in the activity is gained. However, this model has not been tested among nonconsumptive wildlife recreationists.

Bryan (1979) also hypothesized the existence of a process of involvement in wildlife recreation where participants move along a continuum of low to high specialization over time. He proposed a theoretical framework of specialization in birdwatching with beginners, listers or "twitchers", and advanced birders arranged from low to high specialization. Decker et al. (1987) hypothesize that these levels of specialization are behavioral indicators of the process of primary goal orientation shifts. As individuals manifest behaviors of increasing specialization, they should follow a shift in primary goal orientation from achievement or affiliative to appreciative. Differences in reasons for birding between levels of experience have been found where committed birders (those who identify ≥40 species) cited a personal fascination with birds and casual participants (those who could identify ≤10 species) indicated the aesthetic qualities of birds as their main reasons for birding (Kellert, 1985). This suggests that goal orientations change with increasing experience in birding.

The specialization framework has proven useful in describing differences in motivations among individuals within an activity (e.g., Chipman & Helfrich, 1988). This framework is usually measured as a multidimensional construct on an additive scale incorporating such dimensions as the amount of past experience in the activity, commitment to the activity, and how central the activity is to an individual's life. However, studies have shown that examining the differential effects of the underlying dimensions

can provide a better theoretical understanding of how the individual dimensions influence involvement within a recreational activity. For example, in river runners, commitment is associated with such motives as excitement, fun, skill, and fitness; whereas, past experience is associated with convenience and physical workout (Kuentzel & McDonald, 1992), suggesting that the individual dimensions contribute differently to motivations. Knowing how specialization affects motivations will provide further insight into the process of involvement in wildlife recreation.

Determining the motivational orientations of nonconsumptive wildlife recreationists, identifying shifts in motivations with experience, and understanding the process of involvement in wildlife recreation should be of interest to managers developing nonconsumptive recreation programs. Managers have recognized the need to provide the opportunity for satisfying recreational experiences for the nonconsumptive clientele. Knowing the psychological consequences desired from a birding experience will assist managers in developing programs specific for the experience and in targeting audiences for promotion of wildlife programs.

This paper explores the specialization framework as a means of examining the motivations of birdwatchers and the process of birdwatching involvement and discusses implications for developing recreational programs designed to meet specific user group needs. The objective is to determine if birders classified by specialization differ in their motivations for birding. A motivational scale for birding is developed and the following hypotheses tested: (1) there is a significant relationship between specialization levels and primary motivations; and (2) there is a significant difference in correlations between specialization dimension and motivation scores.

Methods

Development of a Motivational Scale

A motivational scale for birders was developed based on motivations for general leisure activities (Beard & Ragheb, 1983; Crandell, 1980), motivations for wildlife recreation (Decker et al., 1987), examination of the birding literature, and personal interviews with 20 key informants.

Interviews and the literature review suggested that most, but not all, motivations for birding could be represented by five motivations.

Key informants identified the three goal orientations (appreciative, affiliative, and achievement) proposed for wildlife recreation (Decker et al., 1987) and for general leisure activities (Beard & Ragheb, 1983; Crandell, 1980). Two additional motivations (conservation and intellectual) were identified by the key informants as important to the birding experience. The following quotes from key informants illustrate the motivations.

Achievement:

"What got me into birdwatching was the challenge and competition..."

"A goal was to see as many different species as possible in one trip"

"I get satisfaction from the challenge of identifying species, the competitiveness, to get as many species as possible"

[A list] "gives goals to work for, sustains the interest. When you've seen red-winged blackbirds 40 times already this year what difference does it make if you see one that day or not, unless that particular bird will give you the goal you need, you're striving for, your one hundredth bird ... makes it more interesting. The other thing to look for is an unusual bird, a particularly good bird, sometimes you go out for a specific bird."

Affiliative:

"I enjoy birding much more with my wife than alone. I probably would not be a involved without her - we feed one another"

[Birding] "provides a focus for the family"

[It] "gives me quite a satisfaction if I see something unusual ... and I often think well I sure wish I had somebody here to share that with me"

Appreciation:

"Under normal circumstances I'm not one to be zipping around from place to place to get different stuff... I was hiking up Mount Robson last year and came across a dippers nest ... we probably sat there for an hour and so it's not important to go out and really see a lot of species. I'm quite happy to hear a varied thrush on a frosty morning or experience the dippers like I did. We saw 50 species that day because we spent 3 hours enjoying something like that. In my view it was still an extraordinarily successful day. So I guess I'm more into that whole environmental thing and aesthetics of being out and appreciating what you see"

"When you're out there it comes down to the fact that you love the birds, you love the outdoors and just feels really great to be out there"

Intellectual:

[I] "never stop learning, as soon as you think you do you might as well be dead"

[The Alberta Breeding Bird Atlas provides me with an opportunity] "to expand knowledge of breeding species"

"Some of the most enjoyable trips I've ever had is when I go out with people who knew more than I do, as long as these people are prone to sharing that information"

"Rather than just watching I want to know all different species and other things"

Conservation:

"The last few times I've been more concerned with the conservation aspect. I'd really like to have all the time in the world and go around and look at high numbers of birds but I can't really see that that's helping conservation too much unless it's sponsored birdathons or something. So the last three times were primarily conservation trips."

"I don't try to find the rare bird for the province. I went through all that and it's not that satisfying. In my opinion there has to be a purpose in what you're trying to do. Teaching was one end of it and the other was building the observatory."

Twenty five statements were developed to represent the five motivations. At least three statements were included to represent each motivation. Most statements for inclusion in the scale were adapted from Decker and Connelly (1989) and Beard and Ragheb (1983). Respondents rated on a 7-point Likert scale (from 1 = not at all to 7 = very) how important each "reason" was to their birdwatching activities.

Analysis of Scale Items

Principal axis factoring with varimax rotation has proven to be a popular technique to represent the meanings of different leisure activities (Graefe, Ditton, Roggenbuck, & Schreyer, 1981). It was used to reduce the 25 items to a smaller number of motivational dimensions. Factors were extracted until eigenvalue fell below 1.0 and interpretability of the factors. A minimum factor loading of 0.30 was

used to identify items belonging to a factor (Gorsuch, 1983:184-186). Scale reliability was checked using Cronbach's alpha.

Primary Motivations

The primary motivation for each birdwatching cluster was determined by obtaining an average score for each motivational factor and selecting the factor with the greatest score (Decker & Connelly, 1989). A Chi-square test was used to test the hypothesis that the distribution of primary motivations differed among the clusters.

Differential Effects of Specialization Components

To understand how the specialization process affects motivations, the differential effects of the specialization dimensions were examined (Kuentzel & McDonald, 1992). Zero order correlations between motivation and specialization dimension scores were compared (Zar, 1974:241-242) to test the hypothesis that the correlations of the specialization components with motivation scores are equal for past experience, economic commitment, and centrality-to-lifestyle.

Results

Birdwatching Motivations

Factor analysis revealed three motivations similar to those proposed by Decker et al. (1987) for wildlife-related recreation and identified a fourth relating to a conservation motivation (Table III.1). Three of the motives, affiliative, achievement, and appreciative, have been associated with hunting (Decker &Connelly, 1989). This suggests that the birdwatching experience involves multiple satisfactions similar to those of hunting. The items hypothesized to form an intellectual dimension loaded on three of the other dimensions. Three items did not load on the factors and were dropped from the analysis.

Primary Motivations

About 89% of respondents had a primary motivation; 25% of these were achievement, 33% appreciative, and 42% conservation oriented (Table III.2). No respondents had primarily an affiliative motivation. The affiliative motivation was not rated as an important reason for birding by any of the specialization levels. Its importance decreased with increasing specialization: casuals had a mean score of 3.81, novices 3.77, intermediates 3.30, and advanced 2.32 ($F = 78.03$, 3 df, $p = .0001$). Of respondents who did not have a primary motivation, 49% scored conservation and achievement equally, 36% scored appreciative and achievement equally, 14% scored appreciative and conservation equally and 1% scored conservation and affiliative equally.

The primary motivation differed by level of specialization, supporting hypothesis 1 (Table III.2). A higher proportion (55%) of advanced birders had an achievement orientation whereas casual birders (43%) tended to have an appreciative orientation, and novice (47%) and intermediate (39%) a conservation orientation.

The distribution of primary motivations (Table III.2) indicates the proportion of respondents having an appreciative orientation decreased across the levels of specialization from the casual (43%) to the advanced group (12%). The proportion with an achievement orientation increased from the casual (17%) to the advanced group (55%). The proportion having a conservation orientation increased from the casual (39%) to the novice group (47%) and decreased in the intermediate (40%) and advanced (33%) groups. These results suggest that the primary motivation changes from an appreciative to a conservation to an achievement orientation as specialization increases. If these results represent a "slice-in-time" approach to birding involvement, as proposed by Bryan (1979), then differences in primary motivations are consistent with the theory that participation in wildlife recreation is a dynamic process involving shifts in goal orientations. However, whether levels of specialization and their corresponding primary motivations represent stages of development or different participation styles requires further investigation.

Differential Effects of Specialization Dimensions

To understand the relationship between the behavioral indicators of specialization and differences in primary motivations, the differential effects of the specialization dimensions on motivations were examined. With one exception, all correlations between the specialization dimensions and motivations were positive and significant (Table III.3). Differential effects of the specialization dimensions and motivations were observed supporting hypothesis 2. The past experience/skill dimension had the highest correlation and differed from the other specialization dimensions with only one exception. The behavioral indicators of specialization that represent on-going involvement in birdwatching, such as number of birding trips, furthest distance travelled on birding outings or trips, and birding skill and ability, are better indicators of motivations than physical items such as equipment, books, and magazine subscriptions.

Discussion

This study adds validity to the Decker et al. (1987) model of continued involvement in wildlife-related recreation by extending the model to a group of nonconsumptive wildlife recreationists. The three goals proposed by Decker et al. (1987) as being salient to wildlife-related recreation, but tested among hunters (Decker & Connelly, 1989), have now been associated with a nonconsumptive activity. The identification of these motivations for birdwatching suggests that multiple satisfactions are sought from nonconsumptive wildlife-related recreation. The motivations of respondents in this study are similar to those of hunters but have different degrees of importance depending on the level of birding experience.

Bryan's (1979) specialization framework provided a useful means of differentiating this group of birders motivations. However, if specialization represents stages of development, the stages identified in this study differed from those proposed by Bryan (1979). Bryan's stages of development or continued involvement in birding emphasized achievement motivations. In Bryan's model the novice birder finds and matches birds with an identification list. Another stage emphasizes the number of

species on a "life list" or seen during formal competition. The more advanced stages place an importance on the skill of observation with emphasis on the study of bird behavior, physical appearance, sounds, and habitat. Respondents in this study place less emphasis on the achievement aspects of identification, listing, and competition. Only the advanced group of birders were associated with primarily an achievement orientation of improving birding skills and knowledge. The casual birder seeks an appreciative experience of enjoying nature and the outdoors; birdwatching may serve as a means to experience nature with little emphasis on birds *per se*. The novice and intermediate birder is interested in contributing to conservation.

The predominant primary motivation among respondents (42%) is to contribute in some way to wildlife conservation. This could be due to a large portion of the sample being drawn from natural history societies or other birding-related organizations which promote wildlife conservation and appreciative aspects of nature. If belonging to organizations influences the conservation motivation, then the proportion of respondents with a conservation orientation should be greatest in the group with the highest proportion holding a membership in wildlife conservation organizations. However, the advanced group had the highest frequency of memberships (98%) but the lowest proportion with primarily a conservation orientation (33%). This reason for birding could also be influenced by respondents participating in a major conservation project, the Alberta Bird Atlas project.

A conservation motivation could have significant implications for wildlife managers. Communicating an agency's role in conservation and recruiting support from new constituents may be most effective when directed to specific specialization levels that have primarily a conservation orientation. For example, recruiting volunteers to assist with conservation projects by contributing to data collection could represent one means of agencies providing an opportunity for participants to satisfy a conservation motivation while educating participants about wildlife conservation.

Developing programs that meet the needs of specific specialization levels will require that these groups be identified easily. The differential effects of the specialization components indicate that the past experience/skill component has the greatest correlation with motivation scores. Because the

usefulness of the specialization construct lies in its ability to predict factors such as motivations, attitudes, and subsequent behavior, a few indicators of on-going involvement may be sufficient to predict desired experiences without the need for elaborate indexes or reliance on conspicuous consumption of birding paraphernalia. Items such as self-reported skill level and identification abilities may be reasonable measures of the degree of birding involvement (Boxall & McFarlane, 1993) and provide a relatively easy means to differentiate users and the experiences they desire. Further research is required to develop indicators of experience in nonconsumptive wildlife-related recreation which are reliable, valid, and easily administered.

Managers involved in the planning and management of wildlife-related recreation must be cognizant of the effect of experience on changing motivations or product needs if they want to provide effective wildlife programs to the birding constituent. A birdwatching program should emphasize a variety of potential experiences and these experiences must be tailored to meet the needs of specific subgroups of birders in order to maximize their satisfaction. Programs should be designed for a particular product such as achieving a certain number of species in a day, assisting in conservation efforts, or a day enjoying nature and marketed to specific groups. To maximize benefits from wildlife-related recreation, managers must provide the opportunity to fulfill a spectrum of goals for each nonconsumptive activity by differentiating the product attributes that are expected or desired (Driver, 1985).

Quality of a recreational experience is usually based on the achievement of goals. If goals are not met then overall satisfaction with the experience declines. Conflict between recreationists occurs when the source of goal interference is attributed to the behavior of other individuals (Graefe, Vaske, & Kuss, 1984). Differences among subgroups in motivations for birding suggest that potential conflict can arise among subgroups. Those who are achievement oriented may cause environmental damage while in pursuit of a particular species and may be in conflict with appreciative or conservation oriented users. If this occurs, some users may be displaced from an area, birding event, or program, stop visiting particular sites, or participating in certain birding events or programs. For example, the Edmonton

Christmas Bird Count may actually discourage those participants whom organizers are trying to recruit. If casual participants are seeking a day outing to enjoy nature, they may perceive the emphasis on the number of species and number of birds seen in a day as being in conflict with their goals. Organizers exhibit great enthusiasm when a rare species is reported. If casual birders are not reporting rare species, they may not perceive their goals as compatible with the goals of organizers and, thus, may not participate in future Christmas Bird Counts. Managers must understand the types of participants they wish to attract and design programs accordingly.

Table III.1. Factor Loadings and Mean Scores for Items Measuring Motivations for Birdwatching[a].

Factor: item[b]	Factor loading	Mean score[c]
Affiliative (63.8% of variance, eigenvalue 8.08):		
gain respect from other birders	0.76	2.23
be considered a good birdwatcher	0.73	2.70
build friendships with other birdwatchers	0.70	3.27
meet people who share my interests	0.67	3.21
be with birdwatching companions	0.62	3.43
compete with other birdwatchers	0.60	1.54
add species to a list	0.53	3.38
help others develop their birdwatching skills	0.51	3.54
contribute to society's general knowledge and understanding of birds	0.48	3.73
Achievement (15.6% of variance, eigenvalue 1.97):		
expand my knowledge of birds	0.66	5.91
improve my birdwatching skills and abilities	0.63	4.88
challenge my birdwatching abilities	0.56	4.26
study birds in their natural habitat	0.53	5.88
see new or rare bird species	0.48	5.12

Table III.1 continued

Factor: item[b]	Factor loading	Mean score[c]
Conservation (7.5% of variance, eigenvalue 0.95):		
contribute to the conservation of birds	0.73	5.24
help wildlife	0.69	5.11
learn about the natural environment	0.42	5.77
Appreciative (6.5% of variance, eigenvalue 0.82):		
get outdoors for a chance to enjoy the natural environment	0.62	5.77
experience the sights, sounds, and smells of the outdoors	0.61	6.20
get away from everyday problems	0.54	4.69
observe all types of wildlife	0.39	3.50
be alone	0.39	6.14

[a] Scale reliability: Cronbach's alpha = 0.91

[b] Each item began with the statement: "One of my reasons for birdwatching is to ..."

[c] Rated on a scale of 1 to 7 where 1 = not at all important and 7 = very important

Table III.2. Distribution of Birdwatchers' Primary Motivations by Level of Specialization.

Primary motivation [a]	Level of birdwatching specialization								Total sample	
	Casual		Novice		Intermediate		Advanced			
	n	%	n	%	n	%	n	%	n	%
Appreciative	138	43.4	72	28.2	18	23.1	6	12.2	234	33.4
Conservation	125	39.3	119	46.7	31	39.7	16	32.7	291	41.6
Achievement	55	17.3	64	25.1	29	37.2	27	55.1	175	25.0
Total	318	100.0	255	100.0	78	100.0	49	100.0	700	100.0

[a] Chi-square test of independence between primary motivation and specialization level ($\chi^2 = 53.51$, 6 df, $p = 0.0000$).

Table III.3. Pearson Product-Moment Correlation Coefficients of Specialization Dimension and Motivation Scores of Birdwatchers.

Motivational orientation	Specialization dimension[a,b]		
	Past experience/skill	Centrality-to-lifestyle	Economic commitment
Achievement	0.506[c]	0.338[d]	0.286[d]
Appreciative	0.241[c]	0.147[d]	0.078[d]
Affiliative	0.526[c]	0.323[d]	0.306[d]
Conservation	0.277[c]	0.225[c]	0.118[d]

[a] Correlation coefficients with different superscripts in the same row are significantly different at $p < 0.05$.

[b] Correlation coefficients >0.11 are significant at $p < 0.01$.

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Chapter IV

Paper III. Attitudes Toward Wildlife and Participation in Wildlife Conservation Activities

Introduction

Specialization theory predicts that participants in a recreational activity progress through a sequence of developmental stages from low to high specialization (Bryan, 1977). One important aspect of specialization involves a shift in attitudes as participants become more concerned with conservation aspects of the resource. Bryan (1977), for example, showed that highly specialized anglers were more concerned with conservation aspects of fisheries management than their less specialized counterparts. This suggestion of a shift to a conservation orientation prompted an examination of the relationship between specialization in birdwatching and participation in wildlife conservation activities. This paper reports the development of a model which examines the relationship between socioeconomic variables, specialization, attitudes toward wildlife, and participation in wildlife conservation activities.

Attitudes and Behavior

Several definitions of attitudes have been proposed over the years (Tesser & Shaffer, 1990). The definitions have included elements of affect or emotion toward the object, behaviors toward the object, and cognitions or thoughts about the object (Vincent & Fazio, 1992). The Wildlife Attitudes and Values Scale (WAVS) is used in this study to measure attitudes toward wildlife (Purdy & Decker, 1989). Purdy and Decker describe WAVS as being comprised of attitude statements which reflect evaluations based on beliefs and feelings.

One aspect of attitude research has concentrated on the ability of attitudes to predict behavior. Two models are relevant to this discussion. Although they are not tested explicitly in this study, they provide an understanding of how attitudes affect behavior. A leading model of the attitude-behavior relation is the theory of reasoned action (Fishbein & Ajzen, 1975). The model proposes that attitudes influence behavior only indirectly through their impact on behavioral intentions. Behavioral intentions

are a function of attitude and the subjective view of the social norms regarding the behavior. Other models have been proposed whereby attitudes influence behavior directly and past behavior has a direct effect on both attitudes and behavior (Bentlar & Speckart, 1979).

Fazio and Zanna (1981) proposed that attitudes alone are often poor predictors of behavior and found strong support for a past behavior-attitude-current behavior relationship. By including mediational variables such as experience, they showed greater attitude-behavior consistency and provided an explanation of the process of attitude formation. In their research, past behavior referred to the level of experience an individual has with the attitude object. Attitudes developed through direct behavioral experiences were found to be better predictors of subsequent behavior than attitudes formed without behavioral experience. Equivalent attitudes that were based on different amounts of direct experience differed in their predictive ability of subsequent behavior. Individuals who formed their attitudes on the basis of direct behavioral experience displayed significantly greater attitude-behavior consistency than individuals who formed their attitudes through indirect means such as reading or being told about the attitude object. Direct behavioral experience with the natural environment through participation in outdoor recreation has been cited as a factor in the development of attitudes to the natural environment and natural resource management (Dunlap & Heffernan, 1975). While the literature on outdoor recreation and attitudes toward the natural environment has not tested specific attitude-behavior models, elements of these models have been included in determining how attitudes predict behavior; whether recreation behavior influences subsequent conservation behavior directly or indirectly through its affect on attitudes.

Outdoor Recreation and Attitudes Toward Natural Resources

While a linkage between outdoor recreation and environmental attitudes was implied by several authors (Jackson, 1986), Dunlap and Heffernan (1975) were one of the first to undertake an empirical examination of the association between outdoor recreation and environmental attitudes, although, only a weak association has been found (Dunlap & Heffernan, 1975; Jackson, 1986; Jackson 1987; Van Liere

& Noe, 1981). However, a stronger association has been found between involvement in appreciative forms of outdoor recreation (e.g., hiking, camping, and visiting state parks and scenic areas) and pro-environmental attitudes than between consumptive forms (e.g., fishing and hunting) and pro-environmental attitudes (Dunlap & Heffernan, 1975; Jackson, 1986; Van Liere & Noe, 1981).

Other studies examining the association between outdoor recreation and environmental attitudes have produced conflicting results. Geisler, Martinson, and Wilkening (1977) found that socioeconomic variables such as age, gender, and place or residence were more strongly related to environmental concern than participation in appreciative, consumptive, or "abusive" (snowmobiling) activities. Pinhey and Grimes (1974) also found weak support for an association between outdoor recreation and environmental attitudes.

Van Liere and Noe (1981) proposed that the discrepancies among these studies were due to poor measures. They used improved measures of involvement in outdoor recreation and a multi-item attitude scale which measured a general orientation toward the environment rather than concern about specific issues. Even with these improved measures, the associations between outdoor recreation and environmental attitudes remained weak. Van Liere & Noe proposed three possible explanations for the low associations: (1) further refinements of the measures are needed; (2) outdoor recreation is not significantly associated with environmental attitudes; and (3) studies have not taken into consideration factors such as recreation specialization which influence interpretation given to a recreational experience. They recommend further research which measures attitudes at a more specific level than general environmental attitudes and includes greater specificity between the attitude measure and the recreational activity in question. Van Liere & Noe (1981:512) suggest that factors that cause "individuals to interpret their outdoor experiences in a manner that creates awareness and concern about the environment and causes them to manifest that concern in their actual behavior" should also be examined. They suggest that recreation specialization is one variable which may effect an individual's attitudes toward natural resources and recommend examining more complex models which include

recreation specialization and greater specificity between the attitude measure and the recreational activity.

Specialization and Attitudes Toward the Resource

Bryan (1977) first proposed the concept of recreation specialization and defined it as "a continuum of behavior from the general to the particular, reflected by equipment and skills used in the sport and activity setting preferences." He used a developmental approach to describe involvement in a recreational activity whereby individuals move from low to high specialization over time accompanied by increasing commitment to the activity. As individuals become specialized, they join a "leisure social world" in which members share similar values and attitudes and engage in similar behaviors. Bryan (1977) found that as specialization increased among anglers, attitudes about the resource shifted from an orientation of catching fish to one of concern for the conservation aspects of the resource. He proposed similar processes for other recreational activities including birdwatching (Bryan, 1979) and concluded that more specialized individuals would be more concerned about conservation aspects of the resource.

Specialized individuals have been shown to exhibit a concern for conservation of the resource by preferring less management intervention and manipulation of the resource than their less specialized counterparts (e.g., Kuentzel & McDonald, 1992; Virden & Schreyer, 1988; Williams & Huffman, 1986). Kellert (1985) found that committed birdwatchers (those who could identify ≥40 bird species) had higher naturalistic and ecologistic attitude scores than casual birdwatchers (those who could identify ≤10 species), suggesting a strong interest in the out-of-doors and concern and interest in wildlife and the natural environment. He concluded that "active birdwatching may promote an enhanced understanding, awareness, and concern for the natural environment." Although these studies suggest a concern for conservation of the resource, the specialization literature has not tested whether differences in resource orientation translate into differences in conservation behavior. The inability of specialization to predict actual behavior (Kuentzel & Heberlein, 1992) and the inconsistency of results from studies employing

the specialization construct (Kuentzel & McDonald, 1992) suggest a need for models which include other variables and actual behavior.

The specialization construct is usually measured on a multidimensional additive scale that incorporates dimensions such as the amount of past experience in the activity, commitment to the activity, and how central the activity is to an individual's life. Examining the individual effects of the underlying dimensions, however, may provide a better theoretical understanding of how specialization influences an individual's attitudes toward the resource and conservation behavior. Kuentzel and McDonald (1992) suggested that including a separate analysis of the underlying dimensions will enhance the explanatory detail available from the specialization construct. Studies of the effects of specialization on attitudes toward the resource have examined bivariate associations (e.g., Kuentzel & McDonald, 1992; Virden & Schreyer, 1988; Williams & Huffman, 1986) and neglected situational variables such as socioeconomic status (Kuentzel & Heberlein, 1992). Because socioeconomic variables have been associated with attitudes toward wildlife (e.g., Kellert, 1980) and participation in wildlife conservation (e.g., Harris, Jr., Miller, & Reese, 1992; Manfredo & Haight, 1986), multivariate analysis which includes these variables should be used to explore the association between specialization, attitudes toward the resource, and conservation behavior.

This paper examines the relationship between participation in outdoor recreation and attitudes toward natural resources by using an activity-attitude measure that is more specific (ie., birdwatching and attitudes toward wildlife) than used in previous research on outdoor recreation and attitudes toward natural resources. It also considers the effects of individual recreation specialization dimensions on attitudes and includes conservation behavior. The objective of this paper is to develop a model which examines the relationship between socioeconomic variables, specialization, attitudes, and participation in wildlife conservation activities. The proposed relationships, which form the basis for the analysis, are illustrated in Figure IV.1. First, the following hypotheses are tested: (1)attitudes toward wildlife scores increase with levels of specialization in birdwatching; and (2) participation in wildlife conservation activities increase with levels of specialization in birdwatching. Second, a multiple regression model is

developed and two hypotheses are tested: (1) attitudes toward wildlife are affected by socioeconomic variables and specialization in birdwatching; (2) participation in wildlife conservation activities is affected by socioeconomic variables, specialization in birdwatching, and attitudes toward wildlife.

Methods

Socioeconomic variables used in the analyses were age, gender, education, household income, and place of residence. Age was measured in number of years. Education was measured in seven categories ranging from no formal education to a post-graduate degree. In multiple regression analyses, the midpoint of each range was used, with 18 years for the final category. Total household income was recorded in one of 11 categories, ranging from <$10,000 to ≥$100,000. As before, the midpoint of each range was used to estimate income, with $105,000 used for the final category. Dummy variables for gender and residence were created with male = 1, female = 0 and rural = 1, urban = 0, respectively.

Separate scores were calculated for each specialization dimension by adding the standardized variables. Each dimension score was treated as a separate variable in the multiple regression.

Respondent's attitudes toward wildlife were measured using the Wildlife Attitudes and Values Scale (WAVS) proposed by Purdy and Decker (1989). The WAVS is comprised of attitude statements which reflect evaluations based on beliefs and feelings. In keeping with Van Liere and Noe's (1981) suggestion of measuring resource-related attitudes at a general level, WAVS represents a measure of a general orientation toward wildlife rather than awareness of, or concern about, specific wildlife problems or issues. The scale measures three attitude dimensions: traditional conservation, societal benefits, and problem acceptance. WAVS has been used on 10 different audiences, representing about 7,000 respondents, and appears to represent a reliable and valid measure of an individual's attitudes toward wildlife. Contributors to a tax check-off program for wildlife conservation have been shown to differ from noncontributors on WAVS scores (Purdy & Decker, 1989), suggesting that WAVS scores may be an indicator of funding wildlife conservation activities.

Respondents rated the 18 WAVS statements on a 7-point scale ranging from strongly disagree to strongly agree. Principal axis factor analysis with varimax rotation was used to extract the attitude dimensions. Separate scores were calculated for each dimension by adding the item scores belonging to a dimension. Total WAVS scores were used in the regression analyses and were calculated by adding all item scores. High scores on the societal benefits and problem acceptance items reflect agreement with nonconsumptive aspects of wildlife. A high score on the traditional conservation items reflects a consumptive orientation to the resource. Therefore, traditional conservation statements were reverse coded for use in regression analyses so that a high score on total WAVS uniformly represented a nonconsumptive orientation. Each respondent's total WAVS score was used as a measure of a nonconsumptive orientation toward wildlife.

Wildlife conservation behavior during 1991 was measured by: the number of memberships in wildlife-related organizations; donations, in addition to membership fees, to wildlife-related organizations; hours spent working as a volunteer for a wildlife-related organization or project; and personal expenditures on maintaining, improving, or purchasing natural areas to provide food or shelter for wildlife. Some studies have treated activity specific memberships as part of the specialization construct. However, because birders' contributions to conservation are primarily through private conservation organizations (Witter & Shaw, 1979), all wildlife-related organizations, rather than just birdwatching organizations, were included as one indicator of conservation behavior. Memberships in birdwatching, naturalist, conservation, and sportsmans' clubs were included.

Analysis of variance (ANOVA) was used to compare WAVS scores and wildlife conservation behavior across levels of specialization. Tukey's studentized range test was used to determine specific mean differences. Standardized OLS regression was used to evaluate the model presented in Figure IV.1. In the first regression analysis, WAVS scores were regressed on socioeconomic variables and specialization dimension scores. In subsequent regression analyses, each of the four conservation activities were regressed on socioeconomic variables, specialization dimension scores, and total WAVS scores.

Results

Factor analysis extracted the three dimensions corresponding to the societal benefits, problem acceptance, and traditional conservation factors (Table IV.1) proposed by Purdy and Decker (1989). One variable, "that local economies benefit from the sale of equipment, supplies, or services related to wildlife recreation", did not load on any of the factors and was dropped from the analysis.

Mean scores on each attitude statement indicate that societal benefits and problem acceptance dimensions were given higher ratings than traditional conservation (Table IV.1). The low ratings (mean <4.0) of statements on personal consumption of wildlife indicate that hunting and trapping are not important activities for most of these individuals. It does not necessarily mean that birdwatchers are opposed to others hunting, as reflected in a slight agreement (mean = 4.3) with game animals being managed for an annual harvest for human use.

A comparison of the mean total WAVS scores indicates a difference occurred between the casual and more advanced levels of specialization (Table IV.2). However, there was no difference between the novice, intermediate and advanced group, providing only partial support for the hypothesis that attitudes toward wildlife scores increase across levels of specialization.

Birdwatchers in this sample were very involved in voluntary conservation activities. About 77% of respondents belonged to at least one wildlife-related conservation organization, 49% donated money to such organizations, 58% volunteered time for wildlife conservation, and 17% provided wildlife habitat. On average, respondents belonged to 1.92 organizations, volunteered 37.8 hours to conservation-related activities, and spent $73 on donations and $285 on wildlife habitat during 1991. A comparison of the means of the conservation activities indicates differences across the specialization levels, supporting the hypothesis that involvement in conservation increases with specialization (Table IV.2).

Multiple regression analysis of total WAVS scores indicates that, of the socioeconomic variables, only gender was significant, with women exhibiting a stronger nonconsumptive orientation than men (Table IV.3). Past experience had the largest standardized coefficient suggesting that this

dimension of specialization has a greater effect on an individual's attitudes towards wildlife than do socioeconomic variables.

The regression analysis explained only 7.2% of the variance in total WAVS scores. However, these results are comparable with studies of differences in environmental attitudes among participants in different forms of outdoor recreation (e.g., Dunlap & Heffernan, 1975; Jackson, 1986; Van Liere & Noe, 1981).

Results of the multiple regression analyses of wildlife conservation activities (Table IV.4) indicate that of the socioeconomic variables, residence was the most consistent predictor of participation in conservation activities, with rural birdwatchers contributing more than urban birders. Gender did not have an effect on any of the conservation activities. Age had a negative effect on time volunteered. Education had a positive effect on memberships. Income had a negative effect on memberships and time volunteered but a positive effect on donations. Compared to other variables in the analysis, socioeconomic variables (residence and income) had the largest standardized coefficients for the amount donated to organizations.

Past experience and economic commitment had effects on all conservation activities. Centrality-to-lifestyle only had an effect on expenditures on habitat. On three of the conservation activities (number of memberships, time volunteered, and expenditures on habitat), a specialization dimension had the largest standardized coefficient suggesting a greater effect from specialization than from socioeconomic variables or total WAVS scores. The magnitude and consistency of the beta coefficients of past experience and economic commitment suggest that these specialization dimensions are the best predictors of conservation behavior. With the exception of donations, socioeconomic variables and attitude scores had relatively low coefficients or were not consistent predictors of involvement in conservation activities.

The total WAVS score was a relatively poor predictor of participation in conservation activities. Attitude scores had an effect on only two activities, memberships and donations, and these coefficients were relatively low compared to the effects of specialization dimensions and socioeconomic variables.

Figure IV.2 presents an illustration of the relationships found from the multiple regression analysis. Relationships found to be significant at the 0.05 level on all four conservation activities are represented by solid lines. These relationships are considered to be supported by the results. Dashed lines indicate significance on two or three of the activities and are considered tentative relationships. Relationships significant on only one activity were considered spurious and not included in Figure IV.2.

Discussion

This study extends previous research on the association between participation in outdoor recreation and attitudes toward natural resources by including recreation specialization, greater specificity between the recreational activity and the attitude measure, and measures of conservation behavior. Although specialization was the best predictor of WAVS scores, the explained variance was low; the largest R^2 was about 0.12. This is consistent with other studies examining the association between outdoor recreation participation and attitudes toward natural resources in which the explained variance was about 10% (Jackson, 1986). These results suggest that including recreation specialization and greater specificity between the activity and attitude measure does not improve upon the association between outdoor recreation and attitudes toward natural resources. This study examined specialization in only one wildlife-related recreational activity. It is possible that respondents could be specialists in other wildlife-related activities such as wildlife photography, score low on birdwatching specialization dimensions, but still have a nonconsumptive orientation to the wildlife resource.

WAVS was a relatively poor predictor of conservation behavior. WAVS represents a general orientation toward wildlife which may explain its poor predictive power on participation in wildlife conservation activities. Attitude-behavior consistency is enhanced by using attitude and behavior measures of equivalent levels of specificity (Fishbein & Ajzen, 1975). General attitudes, such as WAVS, tend to be poor predictors of specific behaviors such as donating time or money to wildlife

conservation. For example, specific environmental attitudes have been shown to be better predictors of pro-environmental behavior than a general orientation toward the environment (Heberlein, 1981).

The past experience dimension of specialization was the best predictor of total WAVS scores and two of the conservation activities. Past experience is a reflection of direct involvement in birdwatching as measured by birding skill and ability, personal involvement, the number of days birding, and distance travelled to birdwatch. The centrality-to-lifestyle and economic commitment dimensions of specialization reflect indirect birding experience obtained through sources such as books and magazines. It has been shown that individuals whose attitudes are formed from direct experience will have greater attitude-behavior consistency (Fazio & Zanna, 1981). Novice, intermediate, and advanced birders had equivalent scores on the WAVS but generally differed in their contributions to wildlife conservation. Contributions increased across levels of specialization, suggesting a greater attitude-behavior consistency with increased specialization (Table IV.2).

The differing effects of the specialization dimensions may be indicative of direct versus indirect experience reflected in the variables used to measure specialization. The few studies that have examined the individual effects of specialization dimensions have generally shown higher associations between direct behavioral indicators and attribute preferences (Schreyer & Beaulieu, 1986), quality judgements (Kuentzel & Heberlein, 1992), and motivations (Kuentzel & McDonald, 1992) than indirect indicators of involvement. The predictive power of the specialization construct on resource related attitudes and conservation behavior may lie in its ability to measure the amount of direct experience with the resource. Those with more direct experience have more information about the attitude object and process and retrieve information differently (Fazio & Zanna, 1981). This is consistent with the cognitive approach to specialization where experienced users have more information about the resource (Hammitt, Knauf, & Noe, 1989; Schreyer, Lime, & Williams, 1984) and undergo cognitive changes that include more complex and differentiated cognitive structures (Schreyer & Beaulieu, 1986; Williams, Schreyer, & Knopf, 1990).

Specialization theory also provides for a social context explanation for differences in conservation behavior. There may be social and cultural determinants that are influencing specialized birders to be more involved in wildlife conservation. Social context that provides awareness and opportunity has been shown to be an important predictor of pro-environmental behavior (Derksen & Gartrell, 1993). Specialization in a recreational activity is accompanied by social and cultural changes as individuals join a "leisure social world" (Bryan, 1977). Joining a "leisure social world" may present an individual with awareness of contribution mechanisms (e.g., habitat improvement projects, funding mechanisms, lobbying campaigns) and exposes him or her to peers who participate in conservation activities and who are role models for conservation behavior.

This study suggests that correlational or bivariate analyses of the effects of specialization may produce misleading results. Many of the bivariate relationships were significant. However, many of these relationships disappeared when the variables were controlled in the multivariate analysis. The multiple regression analysis illustrates how the effects of specialization are attenuated by other variables. A general decline in the magnitude of the beta coefficients and a decreased frequency of statistical significance when socioeconomic variables and WAVS scores are controlled suggests that bivariate analyses may include spurious components. Examining only bivariate associations may be one factor contributing to the inconsistencies of results from studies using the specialization construct. While this study has gone beyond bivariate associations, it represents a preliminary test of a proposed conceptual framework to understand better the relationship between socioeconomic variables, specialization dimensions, attitudes, and behavior. Further research is needed to improve and expand on this model. For example, incorporating improved specificity between the attitude and behavior measure, including other variables such as past conservation behavior, and testing specific attitude-behavior models may improve upon the predictability of the model. The implication of a behavior-attitude-behavior model is that feedback causality can occur. Examining the possible reciprocal effects of attitudes and conservation behavior using simultaneous equations and examining possible interaction effects among the variables may also improve upon the predictability of the models.

This study provides some findings of interest to practitioners. For example, wildlife management agencies wishing to solicit voluntary support of conservation programs need to know what factors influence participation in conservation. The predominance of participation in nonconsumptive wildlife-related recreational activities in North America (Filion et al., 1992; United States Fish and Wildlife Service, 1993) and the potential economic and political influence of participants (Wiedner & Kerlinger, 1990) are causing wildlife agencies to devise methods of raising revenue and generating support for management and conservation programs from this constituent. Whereas contributions to wildlife conservation programs by consumptive users through hunting licence sales are mandatory (i.e., hunting licences are required by law) contributions by nonconsumptive users have been primarily on a voluntary basis. Birders have the potential to voluntarily support programs as shown by their substantial contributions through private conservation organizations and projects. This study suggests that, for birdwatchers, specialization is a better predictor of participation in wildlife conservation activities than socioeconomic variables or attitudes toward wildlife. Thus, programs designed to encourage direct experiences in nonconsumptive wildlife recreation may be more successful in soliciting support for conservation from birdwatchers than those designed to influence attitudes toward the wildlife resource.

Wildlife management agencies have recognized the need to develop nontraditional funding mechanisms to gain financial support from the nonconsumptive user (Hvenegaard, 1989). This study suggests that mechanisms such as using volunteers for data collection, establishing cooperative agreements with non-government organizations, establishing new means to collect money for conservation, and recruiting the nonconsumptive user in preserving private land for habitat, may be acceptable mechanisms for the birding constituent.

Table IV.1. Factor Analysis of the Wildlife Attitudes and Values Scale (WAVS)[a]

Factor label: attitude statement[b]	Factor loadings			Mean score[c]
	Factor 1	Factor 2	Factor 3	
Societal benefits:				
I appreciate the role wildlife play in the natural environment	0.67	0.21	0.07	6.68
I understand more about the behavior of wildlife	0.64	0.25	0.04	6.29
I see wildlife in books, movies, paintings, or photographs	0.60	0.06	0.01	6.19
I know that wildlife exist in nature	0.60	0.19	0.10	6.77
I talk about wildlife with family and friends	0.60	0.21	0.10	5.92
I observe or photograph wildlife	0.58	0.26	0.04	6.24
wildlife are included in educational materials as a subject for learning more about nature	0.56	0.07	0.09	6.60
I consider the presence of wildlife as a sign of the quality of the natural environment	0.52	0.20	0.14	6.56
I express my opinions about wildlife and their management to public officials or to officers of private conservation organizations	0.40	0.30	0.21	5.02

Table IV.1 continued

Factor label: attitude statement[b]	Factor loadings			Mean score[c]
	Factor 1	Factor 2	Factor 3	
Problem acceptance:				
I tolerate most levels of property damage by wildlife	0.22	0.71	0.08	5.17
I tolerate the ordinary risk of wildlife transmitting disease to humans or domestic animals	0.18	0.66	0.04	5.28
I tolerate most wildlife nuisance problems	0.21	0.63	0.11	5.43
I tolerate the ordinary personal safety hazards associated with some wildlife	0.30	0.59	0.00	5.81
Traditional conservation:				
I hunt game animals for food	0.03	0.01	0.82	2.02
I hunt game animals for recreation	0.07	0.01	0.79	1.65
I trap furbearing animals for sale of furs or pelts	0.12	0.04	0.62	1.78
game animals are managed for an annual harvest for human use without harming the future of the wildlife population	0.07	0.11	0.40	4.30
Cronbach's alpha[d]	0.82	0.79	0.74	
Percent variance	60.6	25.8	13.9	
Eigenvalues	4.46	1.98	0.99	

[a] Purdy and Decker (1989). [b] Each statement began with "It is important to me personally that".
[c] Rated on a scale of 1 to 7 where 1 = strongly disagree and 7 = strongly agree. [d] Cronbach's alpha for WAVS scale = 0.79.

Table IV.2. Means[a] of Wildlife Attitudes and Values Scale (WAVS)[b] Scores and Contributions to Wildlife Conservation Among Levels of Birdwatching Specialization.

Attitude and conservation variables	Specialization level				ANOVA statistics	
	Casual	Novice	Intermediate	Advanced	F	p
	n = 341	n = 297	n = 93	n = 56		
WAVS	100.97[c]	104.38[d]	107.34[d]	106.40[d]	10.50	.0001
Number of organizational memberships	1.20[e]	1.89[d]	2.87[e]	4.93[f]	73.64	.0001
Hours volunteered for conservation	17.65[e]	29.89[d]	64.89[e]	157.16[f]	25.20	.0001
Dollars donated to conservation organizations	41.52[e]	73.10[e]	114.65[d]	191.09[d]	6.75	.0002
Expenditures maintaining, improving, or purchasing wildlife habitat	23.41[e]	24.74[e]	67.58[ed]	106.73[d]	4.56	.0036

[a] Any two means that do not have the same superscript are significantly different at the 0.05 level using Tukey's studentized range test.

[b] Purdy and Decker (1989).

Table IV.3. Standardized Regression Coefficients for Relationships Between Socioeconomic Variables, Specialization Dimensions, and the Wildlife Attitudes and Values Scale (WAVS)[a]

Independent variables	WAVS dimensions						Total WAVS	
	Societal benefits		Problem acceptance		Traditional conservation			
	bivariate	partial	bivariate	partial	bivariate	partial	bivariate	partial
Socioeconomic:								
age	.003	-.027	-.049*	-.055	.019	.030	-.015	-.027
gender	-.082*	-.126***	.044	.015	-.180***	-.183***	-.121**	-.154***
education	-.003	.011	.052	.028	.075*	.068	.058	.051
income	-.087*	-.076*	.052	.052	-.017	-.024	-.040	-.036
residence	.015	-.002	.050	.055	-.048	-.038	.011	.011
Specialization dimensions:								
past experience/skill	.312***	.303***	.174***	.184***	.032	.039	.233***	.241***
centrality-to-lifestyle	.194***	.077	.094*	.003	-.038	-.055	.108*	.011
economic commitment	.185***	-.016	.117**	-.014	.038	.062	.149***	.013
Adjusted R^2		.114		.031		.038		.072
F value		12.47***		3.83***		4.52***		7.94***

[a] Purdy and Decker (1989).

* $p < 0.05$. ** $p < 0.01$. *** $p < 0.001$

Table IV.4. Standardized Regression Coefficients for Relationships Between Socioeconomic Variables, Specialization Dimensions, the Wildlife Attitudes and Values Scale (WAVS)[a], and Wildlife Conservation Activities.

Independent variables	Wildlife conservation activities							
	Organization memberships		Time volunteered		Donations to organizations		Expenditures on habitat conservation	
	bivariate	partial	bivariate	partial	bivariate	partial	bivariate	partial
Socioeconomic variables:								
age	-.057	-.058	-.129***	-.135***	-.012	.009	.014	.041
gender	.047	-.001	.056	.018	.061	.032	.058	.025
education	.153***	.140***	.069	.058	.107**	.058	.046	.048
income	-.034	-.074*	-.067	-.082*	.134***	.135***	.068	.031
residence	.151***	.131***	.139***	.120***	.148***	.168***	.420***	.161***
Specialization dimensions:								
past experience/skill	.446***	.245***	.327***	.250***	.196***	.117*	.073	-.141*
centrality-to-lifestyle	.287***	.067	.176***	.004	.105**	-.038	.192***	.144***
economic commitment	.472***	.240***	.285***	.112*	.206***	.104*	.188***	.190***
WAVS score	.199***	.090**	.112**	.035	.124***	.092*	.061	.050
Adjusted R^2		.267		.153		.087		.071
F value		29.63***		15.22***		8.52***		6.98***

[a] Purdy and Decker (1989).

* $p < 0.05$. ** $p < 0.01$. *** $p < 0.001$.

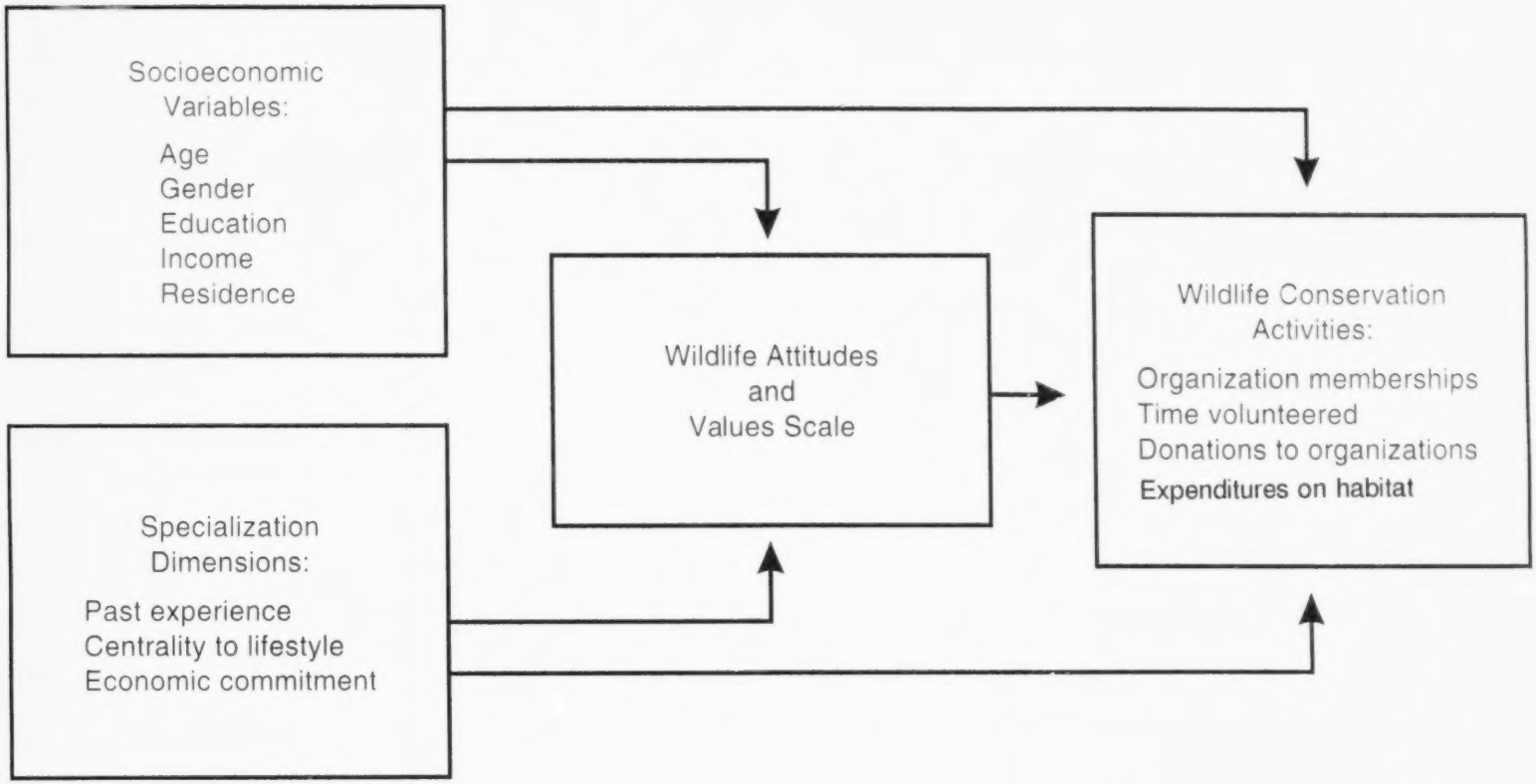

Figure IV.1. Hypothetical Model of Participation in Wildlife Conservation Activities by Birdwatchers.

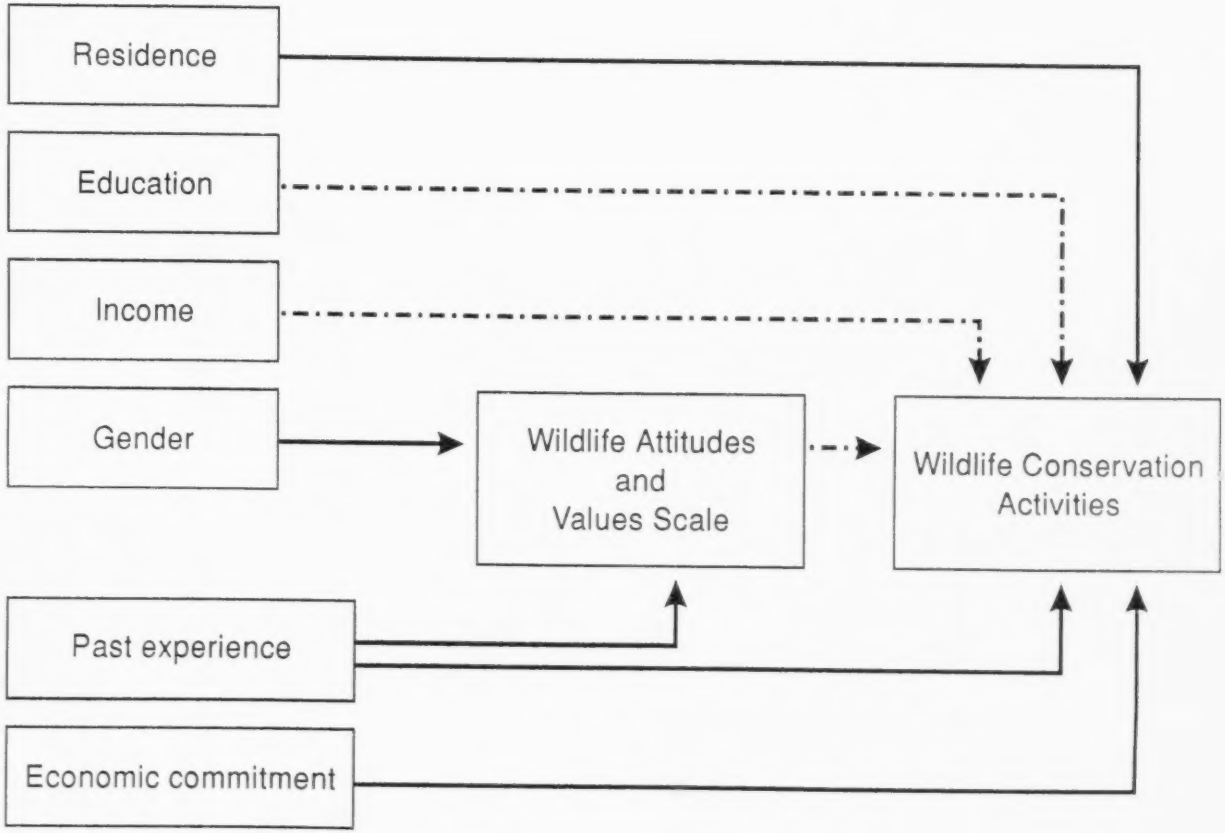

Figure IV.2 Model of Participation in Wildlife Conservation Activities. (Solid lines indicate relationship was significant on all four conservation activities. Dashed lined indicate relationship was significant on two or three of the activities.)

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Chapter V

Paper IV. Socialization Influences of Specialization Among Birdwatchers[1]

Introduction

Studies in wildlife-related recreation indicate a high level of participant in nonconsumptive activities (Filion et el., 1993; U.S. Fish & Wildl. Serv., 1993). For example, in Alberta about 80% of the population watched, photographed, studied or fed wildlife around their homes or on trips during 1991; whereas, only 25% fished and 7% hunted (Filion et al., 1993). Predictions of future participation rates indicate that high levels of participation in nonconsumptive uses are expected to continue into the 21st century (Filion et al., 1992). Recreation and wildlife management agencies have recognized the importance of the nonconsumptive client. They are being challenged to develop products and programs that meet the needs of the nonconsumptive user (Driver, 1985; Thorne, Brown, & Witter, 1992). One aspect of meeting these needs is understanding factors that influence participation (Driver, 1985).

Studies of hunters suggest that participation in wildlife-related recreation is influenced to a considerable extent by a socialization process (Decker, Brown, Driver, & Brown, 1987). Understanding who introduces people and how they are introduced to hunting has assisted managers in predicting who will become a hunter and the extent of involvement in the activity (Purdy & Decker, 1986), and has provided recommendations for hunter education programs (Decker, Purdy, & Brown, 1986). There is a recognized need for recreation managers to understand similar processes operating in nonconsumptive wildlife recreation (Lyons, 1987). This paper reports a study of the socialization factors influencing specialization in birdwatching in Alberta.

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[1] A version of this chapter has been submitted for publication. McFarlane, B. L. 1994. Journal of Human Dimensions of Fish and Wildlife Management.

Leisure Socialization

Kelly (1977:122) defined leisure socialization as "learning the skills, social norms, attitudes, and even tastes appropriate to participation". McGuire, Dottavio, and O'Leary (1987) described socialization of recreation as following two models: a childhood determination model or a leisure career model of participation.

The childhood determination model proposes that leisure participation is learned primarily through childhood experiences. Studies have shown that socialization during childhood can influence participation styles, type of activities, and extent of involvement as an adult. For example, Burch (1969) found that adult camping styles are influenced by childhood camping experiences. Socialization by parents was an important determinant of adult camping style. The number of recreational activities participated in as a child seems to have a direct effect on the number of activities participated in as an adult (Yoesting & Burkhead, 1973; Yoesting & Christensen, 1978) and the frequency of childhood participation seems to affect the extent of adult participation (Christensen & Yoesting, 1973; Sofranko & Nolan, 1972). The influence of childhood socialization factors on the adoption and continued involvement in wildlife recreation has been well documented for hunting (e.g., Applegate, 1989; Purdy & Decker, 1986). Hunters who grow up in rural areas, with strong family involvement, who participate with family members, and who are exposed to hunting experiences before the age of 16 years have high levels of hunting activity and exhibit a strong commitment to it. Purdy, Decker, & Brown (1989:17) conclude that "other people, not magazines, TV shows, or other forms of communication, recruit new hunters" and "commitment to recreational hunting is largely due to social influences and associated experiences." Although childhood experiences have been shown to be a major influence on hunting involvement as an adult, a childhood determination model does not appear to be adequate to explain adult behavior in all recreational activities.

Kelly (1974; 1977) proposes that leisure socialization is a life-long process and not simply a refinement of leisure behavior learned during childhood. He found that leisure activities were evenly divided among those begun in childhood and those begun in adulthood No differences occurred in the

kinds of activities begun as a child and those begun as an adult nor with whom activities are begun in childhood and adulthood. He suggested that leisure participation follows a career in which skills, attitudes, relationships, roles, and resources change through the life cycle. Activities are added, dropped, expanded, and relearned depending on an individual's circumstances. The same activity may have different social meanings and role relations at different times. He concluded that a childhood determination model does not adequately explain leisure participation and that recreation participation is a continuous and dynamic process occurring throughout the life cycle.

Recreation Specialization

Bryan (1979) proposed a process of involvement in birdwatching where participants become specialized in the activity through a socialization process. He developed a conceptual model for specialization in birdwatching with beginners, listers or "twitchers", and advanced birders arranged from low to high specialization. Based on studies of fishing, he described specialization in an activity as "a continuum of behavior from the general to the particular, reflected by equipment and skills used in the sport and activity setting preferences."

Bryan proposed that specialization is accompanied by a refinement of skill and knowledge, an increasing commitment to the activity, a shift in attitudes toward the resource and management preferences, and changes in social group affiliation. Individuals join a "leisure social world" as they move along a continuum of involvement from low to high specialization over time. Participants in the leisure social world share similar attitudes, beliefs, and ideologies, engage in similar behavior, and have a sense of group identification. This peer group serves as a reference group for the specialist's value system. Frequent contact among members of this group keeps the system together. The leaders of the leisure social world are highly visible and are the articulators of the specialist's value system. Leaders of recreational organizations and writers of magazines and newsletters are examples of the specialists who communicate the group's value system. Bryan (1977) found that the social group in which one participates varies according to the level of specialization. Family outings constituted the most frequent

situation for less specialized anglers and fishing with peers who have similar interests and skills was the most frequent situation for the most specialized anglers. Bryan's socialization process of joining a leisure social world suggests that specialization follows a model similar to Kelly's leisure career model, in which specialization follows a career where skills, attitudes, relationships, and roles change with experience.

Specialization research has concentrated on motivational (e.g., Chipman & Helfrich, 1988; McFarlane, 1994), attitudinal differences (e.g., Wellman, Roggenbuck, & Smith, 1982), management and environmental preferences (e.g., Chipman & Helfrich, 1988; Virden & Schreyer, 1988; Schreyer & Beaulieu, 1986), and perceptions of crowding (Graefe, Donnelly, & Vaske 1986; Vaske, Donnelly, & Heberlein, 1980). However, the specialization literature has not examined the socialization factors influencing specialization or the socialization process by which participants become specialized. The objective of this paper is to determine if birding specialization levels differ in their socialization influences. This paper examines the social agents and socialization process for specialization in birdwatching to determine if specialization in a nonconsumptive wildlife-related recreational activity follows a childhood determination model, as suggested by the hunting literature, or a leisure career model of participation, as suggested by the specialization literature. The models were tested by determining the life cycle stage at which birdwatching was begun and comparing social influences across specialization levels. The following hypotheses were tested: (1) a larger proportion of specialized birders start birding during the early life-cycle stages; (2) there is a significant difference in adoption influences between specialization levels during initiation at childhood and adulthood; (3) there is a significant difference in social groups with whom birding was begun between specialization levels during initiation at childhood and adulthood; (4) there is a significant difference in the social groups of current participation between specialization levels.

Methods

To determine if the life cycle stage at which an individual started birdwatching had an effect on specialization, respondents were asked for their age at which they started birding. The age at starting was divided into four categories corresponding to life cycle stages described by Kleiber and Kelly (1980). "Childhood-adolescence" represented those starting between 1-18 years of age; "young adulthood," 19-35 years; the "middle years," 36-55 years; and the "later years," over 55 years. Categories were collapsed into two, childhood (≤18 years of age) and adulthood (>18 years of age), to simplify data presentation in subsequent analyses of social groups at initiation and adoption influences.

To determine the importance of factors influencing respondents to start birdwatching, respondents rated 15 statements representing social, knowledge, and opportunity items using a 7-point scale (where 1 = not at all important and 7 = very important). Principal axis factor analysis with varimax rotation was used to identify common factors. Factors were extracted until the eigenvalue fell below 1.0. A minimum factor loading of 0.30 was used to identify variables belonging to a factor. Scale reliability was determined using Cronbach's alpha. A primary adoption influence for each specialization cluster was determined by obtaining an average score for each factor and selecting the factor with the greatest score.

Social groups at initiation into birding were determined by asking respondents "When you first started birdwatching, with whom did you usually birdwatch?" Respondents checked all that applied from a list consisting of family members, friends, organized club, or alone. To determine the social groups of current birding activities, respondents were asked to indicate with whom they usually birdwatch from the same list. Relationships between level of specialization and socialization variables were analyzed using Chi-square tests of independence.

Results

Results show an even distribution of initiation into birding at different stages of the life cycle across levels of specialization (Table V.1). This suggests that attaining an advanced level of birding is

not influenced by one's age of initiation into the activity. The proportion of respondents starting birdwatching decreased over the life cycle, regardless of the level of specialization, suggesting that participation in birding starts primarily during childhood-adolescence and young adulthood.

Three factors were identified for the adoption influences (Table V.2): (1) a leisure social world factor consisting of items relating to exposure to experienced birdwatchers; (2) a knowledge/opportunity factor consisting of time availability, access to birding opportunities, reading about wildlife and watching TV shows and movies about wildlife, and two other variables which may provide introductory first-hand experience - maintaining a birdfeeder and maintaining a nestbox; and (3) a family support factor which included items relating to social support provided by family members. One item "experiences hunting wildlife" did not load on any of the factors and was dropped from the analysis. Scale reliability indicated a Cronbach's alpha of 0.81.

About 96% of respondents had a primary adoption influence: 51% of these were leisure social world, 24% were knowledge/opportunity, and 21% were family support. Differences occurred among the levels of specialization on the proportion of respondents having a primary adoption influence of leisure social world and family support but not knowledge/opportunity (Table V.3). These differences suggest that specialization in birding involves a socialization process. Regardless of whether respondents started birding during childhood or adulthood, a higher proportion of the intermediate and advanced participants had a primary influence of family support compared to their less specialized counterparts. The proportion rating the leisure social world as the most important tended to decrease with increasing specialization.

Social group participation during initiation into birding shows that the trend in birding with friends and organized club members was the same regardless of whether respondents started birding during childhood or adulthood (Table V.4). The proportion starting with friends and members of organized clubs tended to increase with specialization. Of those starting during childhood, the proportion birding with family members decreased with increasing specialization while the proportion birding alone increased. The relatively large portion of the more advanced birders starting with club

members suggests the importance of being exposed to members of the leisure social world early in the birding career. The large proportion of respondents who birded alone during initiation suggests a high degree of intrinsic motivation, especially for the advanced birders who started during childhood (76%).

The social groups of current birding activities indicate that most respondents participate alone (69%) or with a family member (61%) (Table V.5). As specialization increases a higher proportion participate with friends and organized club members. This pattern is the same as social group participation during initiation into the activity (Table V.4) suggesting that more specialized birders may not shift the social group with whom they participate, but instead, join the leisure social world from the beginning.

Discussion

These results do not support a childhood determination model but provide evidence for a leisure career model of specialization. The stage of the life cycle at which people started birding did not differ for the specialization levels. Advanced birders were no more likely than casual birders to have started birding during childhood-adolescence. It appears that for specialization in birding, the stage of the life cycle in which birding starts is less important than socialization influences. The trend in socialization influences is similar across the levels of specialization regardless of whether they started during childhood or adulthood.

This study identified two socialization factors during initiation into birding that appear to influence specialization in birdwatching; participation with friends and members of organizations, and family support of one's birding activities. The larger proportion of advanced birders who participated with peers and members of organizations during initiation into the activity suggests the importance of the source of introduction into birdwatching. However, participation with family social groups does not seem necessary for specialization in birdwatching. Exposure to other birdwatchers, who are members of the leisure social world, early in the birding career may be an important factor in subsequent specialization regardless of the life cycle stage at which the activity is begun. These birdwatchers may

serve as role models that transmit the behavior and attitudes associated with the activity to new participants from the outset of the birding career. Role models are a source of information for the values, standards, and behavior appropriate for the activity (Bandura, 1977) and may facilitate the specialization process (Bryan, 1977). The role of family members in specialization seems to occur through their perceived support of birding activities. Family support was more important as an adoption influence for the more specialized birders than casual and novice participants.

Unlike hunting in which commitment is associated with strong family influences and childhood initiation, specialization in birding can result from initiation at any stage in the life cycle and involves participation with peer groups and family support. It is predicted that participation in birdwatching will increase in the future (Kelly, 1987:77). As more people become involved in birding and are exposed to members of the leisure social world, more individuals may become specialized. This has implications for recreation managers in that specialized birders may have different attitudes (Kellert, 1985), motivations (McFarlane, 1994), and management and environmental preferences (Bryan, 1979). Recreation and wildlife management programs may have to consider the changing needs of participants if they are to conduct successful wildlife-related recreation programs in the future.

Leaders of the birding community may have a role to play in recruiting new participants and encouraging the development of committed birders. Simply knowing about wildlife and having the opportunity to participate may not be enough to develop committed birders. Interaction with leaders in the birding community may provide the stimulus necessary to develop a commitment to the activity. Programs or events which match the inexperienced with experienced birders may assist the socialization process if becoming a committed birder.

Although this study has provided insight into the socialization influences of specialization in birdwatching, the limitations of the data must be recognized. The study required respondents to recall their past birding experiences and make judgements concerning the extent of influences on their birding activities. The ability of respondents to accurately recall and assess such details is questionable, especially over long recall periods (Tarrant & Manfredo, 1993).

Table V.1. Distribution (%) of Life Cycle Stage During Initiation into Birdwatching Among Specialization Clusters

Life cycle stage (age in years)	Level of specialization[a]				Total sample
	Casual	Novice	Intermediate	Advanced	
	n=341	n=297	n=93	n=56	n=787
Childhood-adolescence (1-18)	39.6	42.8	40.9	58.9	42.3
Young adulthood (19-35)	36.7	34.0	33.3	26.8	34.6
Middle years (36-55)	19.1	20.5	22.6	14.3	19.7
Later years (>55)	4.7	2.7	3.2	0.0	3.4

[a] Chi-square test of independence: $\chi^2 = 11.2$, 9df, $p = 0.264$

Table V.2. Factor Analysis of Adoption Influences for Birdwatching

Factor label: statement	Factor 1	Factor 2	Factor 3
Leisure social world:			
taking organized field trips	0 .90	0.11	-0.01
going afield with other birders	0.85	0.06	0.03
joining a birding club or natural history society	0.80	0.15	0.01
taking birding related courses	0.65	0.21	0.00
participating in organized bird studies	0.36	0.33	0.07
Knowledge/opportunity:			
watching TV shows/movies about wildlife	0.18	0.61	-0.01
maintaining a birdfeeder	-0.07	0.60	0.14
maintaining a nestbox	-0.04	0.52	0.22
reading about wildlife	0.28	0.48	0.07
life changes that allowed time to participate	0.23	0.44	0.02
having access to a natural area	0.13	0.32	0.21
Family support:			
family member who was a birder	0.04	0.09	0.72
family that was supportive of birding	0.05	0.08	0.70
going on family nature outings as a child	0.09	0.10	0.59
Eigenvalue	3.47	1.74	1.01
Percent variance	55.9	26.5	12.9

Table V.3. Distribution (%) of Primary Adoption Influences Among Specialization Levels of Birdwatchers

Primary adoption influence	Initiation into birding											
	Started during childhood						Started during adulthood					
	Casual	Novice	Intermediate	Advanced	χ^2	p	Casual	Novice	Intermediate	Advanced	χ^2	p
	n = 135	n = 127	n = 38	n = 33			n = 206	n = 170	n = 55	n = 23		
Family support	5.4[a]		19.7[a]		15.0	.000	16.5	33.5	61.8	43.4	47.6	.000
Leisure social world	56.3	41.7	34.2	27.3	13.5	.004	66.5	51.2	27.3	47.8	29.6	.000
Knowledge/ opportunity	35.6	45.7	52.6	36.4	5.2	.159	14.6	11.7	5.6	4.4	4.8	.185

[a] Casual and novice categories, and intermediate and advanced categories were collapsed to allow for sufficient cell frequencies for statistical analysis.

Table V.4. Distribution (%) of the Social Groups of Participation During Initiation into Birdwatching Among Specialization Levels

Social group	Initiation into birding											
	Started during childhood						Started during adulthood					
	Casual	Novice	Intermediate	Advanced	χ^2	p	Casual	Novice	Intermediate	Advanced	χ^2	p
	n = 135	n = 127	n = 38	n = 33			n = 206	n = 170	n = 55	n = 23		
Family	65.9	67.7	63.2	39.4	9.6	.002	50.0	45.9	65.5	52.2	6.4	.093
Friends	22.2	20.5	36.8	36.6	7.1	.069	28.2	30.6	40.1	26.1	9.3	.025
Organized club	7.6[a]		19.7[a]		8.9	.003	18.9	33.5	45.5	30.4	19.3	.000
Alone	44.4	51.2	55.3	75.8	10.7	.014	54.4	50.0	56.4	52.2	1.02	.796

[a] Casual and novice categories, and intermediate and advanced categories were collapsed to allow for sufficient cell frequencies for statistical analysis.

Table V.5. Distribution (%) of Social Groups Relating to Current Birdwatching Activities Among Levels of Specialization

Social group	Level of specialization				χ^2	p	Total Sample
	Casual n = 341	Novice n = 297	Intermediate n = 93	Advanced n = 56			
Family	59.2	65.0	63.4	50.0	5.5	.139	61.3
Friends	32.3	45.8	72.0	48.2	49.6	.000	43.2
Organized club	11.4	30.3	33.9	43.0	57.6	.000	23.9
Alone	67.5	67.3	83.9	62.5	11.5	.009	69.0

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Chapter VI

Discussion and Conclusions

Previous studies have recognized the need to explore the heterogeneity of nonconsumptive wildlife users (e.g., Driver, 1985; Thorne, Brown, & Witter, 1992; Manfredo & Larson, 1993). However, even after numerous calls for more work in this area and several studies, nonconsumptive wildlife recreationists are still poorly understood. Generally, studies of nonconsumptive wildlife users have concentrated on specific management issues or summary statistics and have lacked theory testing to understand the processes involved or the consequences of participation. This study examined one group of nonconsumptive wildlife users, birdwatchers, within the context of the theory of recreation specialization.

This study has demonstrated that birdwatching can be represented by the recreation specialization construct as proposed by Bryan (1979). Three components: past experience/skill, economic commitment, and centrality-to-lifestyle were identified for the specialization construct which corresponds to dimensions identified in studies of other recreationists (McIntyre & Pigram, 1992; Virden & Schreyer, 1988; Wellman, Roggenbuck, & Smith, 1982). The development of profiles through the use of cluster analysis can be used to examine the heterogeneity of birders. Four distinct subgroups of birders were defined, based on their level of experience and involvement in the activity. However, whereas this study demonstrated that the specialization construct can be applied to birding, the levels do not correspond to Bryan's achievement-oriented stages of development.

Influences of the leisure social world as proposed by Bryan (1979) appear to affect the process of becoming specialized. Life cycle stage of initiation into birding was not associated with specialization, suggesting that specialization is not influenced by the age at which an individual starts birding. However, exposure to role models of the leisure social world early in the birding career and perceived support from family were associated with specialization levels, suggesting that social learning processes are important for the process of specialization in birding.

A motivational scale for birdwatching was developed and tested. Four motivations were identified as salient for the birding experience: appreciation, conservation, achievement and affiliation. Primary motivations differed across levels of birding specialization. This study suggests that the Decker, Brown, Driver, & Brown (1987) model of involvement in wildlife recreation can be extended to include nonconsumptive users and suggests that specialization may be a useful means of differentiating product attributes of the birding experience. Managers should be aware that experience in an activity can affect the desired products of nonconsumptive wildlife recreationists. They should provide a variety of opportunities within an activity in order to maximize satisfaction for participants and to broaden the economic and non-economic benefits that accrue to society from the wildlife resource (Schreyer & Driver, 1989). In non-econmic terms, these benefits could include improving social harmony, environmental protection, and quality of life. In economic terms, by meeting the recreational needs of individuals, the welfare or well-being of society is increased by enhancing consumer surplus (Walsh, 1986). For example, attracting people to birdwatching may enhance transformation values and targetting specific audiences with birding opportunities may capture economic rents. Further research is required to verify the existence of the motivations identified in this study among other populations of birders and other groups of nonconsumptive wildlife recreationists.

This sample of birders was very involved in wildlife conservation activities. Participation in wildlife conservation activities increased with specialization. A model was developed that examined the relationship between socioeconomic variables, specialization, attitudes toward wildlife, and participation in wildlife conservation. Specialization appeared to be the best predictor of involvement in wildlife conservation.

Examination of the individual specialization components provides insight into the processes underlying specialization. The past experience/skill component, which represents a measure of direct experience in birding, had the highest correlation with motivations and was the best predictor of attitude scores and participation in two of four wildlife conservation activities. The predictive power of recreation specialization may lie in its measure of direct behavioral involvement in the activity.

Modifying attitudes may not be sufficient to change behavior (Vincent & Fazio, 1992). Direct experience with wildlife and its conservation may be one means of improving contributions to wildlife conservation. This has implications for agencies wishing to solicit support for wildlife conservation from the birding constituent. Programs aimed at encouraging direct experience with wildlife may be more likely to bring about voluntary participation in wildlife conservation than those aimed at changing attitudes toward wildlife.

Although many studies suggest that specialization is a multidimensional construct, examining the dimensions individually suggests that it may not be necessary to include all dimensions when trying to predict behavior, attitudes, or management preferences. A dimension which measures direct behavioral experience may drive certain recreation-related attitudes, motivations, and subsequent behavior more than other dimensions. Only a small number of variables that reflect experience, such as information on birding trips, skill, and identification ability, may be fundamental to distinguishing motives, attitudes, and behavior. These few items could indicate the ranges of birding typologies at a relatively low cost to the investigator and the respondent (Chipman & Helfrich, 1988). This provides further evidence that elaborate indexes may not be required to determine preferred recreational experiences and supports Bryan's (1979) hypothesis that a few well reported measures of experience and skill may be adequate to distinguish management needs among users. It also supports Boxall and McFarlane's (1993) suggestion that, in nonconsumptive wildlife recreation, a few self-reported measures of experience and skill may be adequate to distinguish management needs among users.

Although this study is not representative of all birdwatchers in Alberta, the subgroups identified can assist in designing programs and events, identifying educational and information needs, and selecting strategies for wildlife conservation efforts. In considering strategies to enhance birding opportunities one should ask, "How are the recreational and wildlife management needs of these birders being met?" For example, are programs currently in place designed to enhance the "backyard" birding experience? What opportunities do current birding areas provide and which group(s) would most likely visit these areas? Are some groups' needs being left out of planning and allocation decisions?

There could be a high latent demand for involvement in birding programs or membership in wildlife-related organizations. About 40% of the Alberta population participates in some form of birding (Manecon Partnership, 1991), but only 2,000 names were generated for sampling from the most prominent birding-related organizations in the province. This suggests that the vast majority of Alberta's birders are not involved in birding-related organizations and their associated programs.

Nonconsumptive wildlife recreational managers are becoming aware of the need to implement programs that accommodate a diversity of satisfactions and benefits desired by the public (Manfredo & Larson, 1993). The typology developed in this study shows that the recreation specialization framework can provide a means of identifying birdwatcher subgroups and their management needs. Casuals birders are primarily backyard birders with low identification skills and knowledge of birds. Their birding experiences could be facilitated by providing information on how to attract birds to their backyards. For example, information on which species will be attracted by different bird feed and how to landscape around a residence to attract various species may enhance the casual birders experience. Since the majority do not own many books related to birding and cannot identify many species, information on how to identify birds, natural history of common species, especially those that frequent birdfeeders, and identification charts or pamphlets may satisfy their information needs. This group could be educated on the importance of wildlife conservation and how to get involved. With education on bird identification, this group could be important for bird census projects such as feederwatch programs.

Intermediate and advanced birders would benefit from information about activities such as photography and painting. Information on specific knowledge of behavior and habitat, where to find rare birds, and a birding "hot-line" which provides birding information over the telephone, would enhance their birding experiences. These groups could be recruited to lead bird walks, teach others about birds, and initiate or participate in conservation activities.

Novice birders would probably benefit from a mix of the strategies aimed at the casual and more advanced birders. This group participates primarily for conservation reasons and could represent an important target group for recruiting participants for conservation activities.

Since most wildlife management agencies are experiencing decreasing revenues for wildlife conservation from hunting licence sales, new strategies for support of wildlife conservation are needed (Hvenegaard, 1989). The nonconsumptive user of wildlife has been identified as a potential contributor to conservation programs. Results from this study show that birders make substantial contributions to conservation through nontraditional means. In addition to the more conventional financial contribution scheme, it may be necessary for agencies to develop innovative mechanisms to take advantage of birdwatchers' support. For example, using experienced birders' knowledge and expertise to help identify wildlife management issues and volunteer for specific conservation projects such as data collection. Other initiatives that could prove beneficial are establishing new partnerships with the birding constituent through such means as cooperative research projects and management agreements with birding-related organizations.

This study has provided some insight into involvement in nonconsumptive wildlife-related recreation. However, further research is required on other populations of birdwatchers and other groups of nonconsumptive wildlife users to determine if the findings of this study are applicable beyond birdwatchers in Alberta.

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Appendix I

Organizations Sampled for the Mail Questionnaire

Edmonton Natural History Club

Edmonton Christmas Bird Count

Edmonton Bird Club

Calgary Field Naturalists

Red Deer River Naturalists

Lethbridge Natural History Club

Bow Valley Naturalists

Vermilion Natural History Society

Buffalo Lake Naturalists

Beaverhill Lake Bird Observatory

Appendix II

Code Book for the Questionnaire

Wildlife Conservation and Birdwatching:

A Survey of Albertans' Activities and Opinions

1. The questionnaire is coded on a total of three cards.

2. Each card begins with:

    a. a three digit respondent/questionnaire identification number
    b. a one digit card number

3. Questions 1 through 9 are coded on card 1; Questions 10 through 18 a. 8 are coded on card 2; Questions 18 a. 9 through 30 are coded on card 3.

4. Missing values for all variables = .

    Variable ID1 (cols 1-3) Three digit questionnaire number on front page.

    Variable Card1 (cols 5) Card number - code 1.

    Variable Origin (cols 7-8) Origin of returned questionnaire mailing determined by postal code; recorded on front page of questionnaire.

        01 Edmonton, St. Albert, Sherwood Park, Fort Saskatchewan, Tofield, Spruce Grove, Wetaskawin, Bon Accord, Grande Prairie
        02 Calgary, Buffalo
        03 Red Deer, Rimbey, Lacombe, Rocky Mtn. House, Lousana, Sylvan Lake, Olds, Blackfalds
        04 Lethbridge, Coaldale, Monarch, Diamond City, Cardston, Claresholm
        05 Stettler, Mirror, Nevis, Erskine
        06 Canmore, Banff, Jasper
        07 Vermilion, Paradise Valley, Vegreville, Ashmont, Dewberry
        08 Wildbird General Store

Question 1. Variable Read (cols 10) Read books, etc.

        0 = No
        1 = Yes

    Variable Films (cols 11) Watched films, etc.

        0 = No
        1 = Yes

Variable Art (cols 12) Purchased art, etc.

0 = No
1 = Yes

Variable Visit (cols 13) Visited a zoo, etc.

0 = No
1 = Yes

Question 2. Variable Org (cols 15-16) Number of memberships in conservation organizations
Code actual number of memberships recorded:

00 = No
01 = 1 membership
02 = 2 memberships
.
.
.

Question 3. Variable Donate (cols 18-22) Amount of money donated to conservation organizations
Code actual dollars recorded:

00000 = No
00050 = 50 dollars
00100 = 100 dollars
.
.
.

Question 4. Variable Habitat (cols 24-28) Amount of dollars spent to maintain, improve or purchase natural areas.

Code actual dollars recorded:

00000 = No
00010 = 10 dollars
00500 = 500 dollars
.
.
.

Question 5. Variable Time (cols 30-33) Number of hours worked as a volunteer for wildlife organization or project.

Code actual hours recorded:

0000 = No
0002 = 2 hours
0040 = 40 hours
.

Question 6. Wildlife Attitudes and Value Scale (WAVS)

Variable:	WAVS1A (cols 35)	Talk about wildlife ...
	WAVS2A (cols 36)	Observe or photograph ...
	WAVS3A (cols 37)	Tolerate wildlife nuisance problems ...
	WAVS4A (cols 38)	Trap furbearing animals ...
	WAVS5A (cols 39)	Wildlife as a sign of quality of natural environment ...
	WAVS6A (cols 40)	Hunt for recreation ...
	WAVS7A (cols 41)	See wildlife in books, ...
	WAVS8A (cols 42)	Tolerate property damage ...
	WAVS9A (cols 43)	Express opinions about wildlife ...
	WAVS10A (cols 44)	Know that wildlife exist ...
	WAVS11A (cols 45)	Tolerate risk of transmitting disease ...
	WAVS12A (cols 46)	Hunt for food
	WAVS13A (cols 47)	Local economies benefit from sales
	WAVS14A (cols 48)	Appreciate the role of wildlife
	WAVS15A (cols 49)	Wildlife included in educational materials
	WAVS16A (cols 50)	Game animals managed for an annual harvest
	WAVS17A (cols 51)	Tolerate personal safety hazards
	WAVS18A (cols 52)	Understand behaviour of wildlife

Code: WAVS1A - WAVS18A

1 = Strongly Disagree
2
3
4 = Neither Agree nor Disagree
5
6
7 = Strongly Agree

Question 7. Variable Home (cols 54) Birdwatched or fed birds at home

0 = No
1 = Yes

Variable Trips (cols 55) Outings or trips for main purpose of birdwatching

0 = No
1 = Yes

Variable Other (cols 56) Birdwatched on outings or trips for other purposes

0 = No
1 = Yes

Variable Days (cols 58-60) Total days on outings or trips

Record actual number of days.

000 = None
001 = 1 day
.
.
.
365 = 365 days

Variable Distance (cols 61) Furthest distance travelled on outings or trips.

1 = <1 km
2 = 1-100 km
3 = 101-200 km
4 = 201-500 km
5 = >500 km

Question 8. Variable Fed (cols 63) Maintained a feeder or nest box

0 = No
1 = Yes

Variable List (cols(64) Kept a list of species

0 = No
1 = Yes

Variable Notes (cols 65) Kept notes of activities of birds

0 = No
1 = Yes

Variable Photo (cols 66) Photographed, drew or painted birds

0 = No
1 = Yes

Variable Songs (cols 67) Recorded bird songs

0 = No
1 = Yes

Variable Census (cols 68) Took part in an organized bird census

0 = No
1 = Yes

Variable Led (cols 69) Led a birdwatching walk or tour

0 = No
1 = Yes

Variable Attend (cols 70) Attended a birdwatching walk or tour

0 = No
1 = Yes

Question 9. Variable Parent (cols 72) Birdwatch with parent

0 = No
1 = Yes

Variable Spouse (cols 73) Birdwatch with spouse

0 = No
1 = Yes

Variable Child (cols 74) Birdwatch with my children

0 = No
1 = Yes

Variable Relat (cols 75) Birdwatch with an other relative

0 = No
1 = Yes

Variable Friend (cols 76) Birdwatch with a friend

0 = No
1 = Yes

Variable Grpfr (cols 77) Birdwatch with a group of friends

0 = No
1 = Yes

Variable Club (cols 78) Birdwatch with an birding club or natural history society

0 = No
1 = Yes

Variable Self (cols 79) Birdwatch by myself

0 = No
1 = Yes

Variable Othpeopl (cols 80) Birdwatch with other people not listed in question

0 = No
1 = Yes

CARD 2

Variable ID2 (cols 1-3) Three digit questionnaire number on front page
Variable Card2 (cols 5) Card number - code 2

Question 10.

Variable:

Suspar (cols 7) Sustained by parent
Sussp (cols 8) Sustained by spouse
Susrel (cols 9) Sustained by other relative
Susteach (cols 10) Sustained by teacher or professor
Susfr (cols 11) Sustained by a friend
Susgrp (cols 12) Sustained by a group of friends
Susclub (cols 13) Sustained by a club or society
Susoth (cols 14) Sustained by other

Code: Suspar - Susoth

1 = Not at all important
2
3
4
5
6
7 = Very important

Question 11.

Variable:

Reasn1s (cols 16) Learn about natural environment
Reasn2s (cols 17) Enjoy natural environment
Reasn3s (cols 18) Add species to list
Reasn4s (cols 19) Build friendships
Reasn5s (cols 20) Help wildlife
Reasn6s (cols 21) Observe all wildlife
Reasn7s (cols 22) New or rare species
Reasn8s (cols 23) Expand knowledge of birds
Reasn9s (cols 24) Get away
Reasn10s (cols 25) Challenge abilities
Reasn11s (cols 26) Be with companions
Reasn12s (cols 27) Contribute to society's knowledge of birds
Reasn13s (cols 28) Be alone
Reasn14s (cols 29) Improve skills
Reasn15s (cols 30) Be with family or friends

Reasn16s (cols 31) Contribute to conservation
Reasn17s (cols 32) Compete with birdwatchers
Reasn18s (cols 33) Meet people
Reasn19s (cols 34) Help others
Reasn20s (cols 35) Experience outdoors
Reasn21s (cols 36) Show species to family or friends
Reasn22s (cols 37) Considered good birdwatcher
Reasn23s (cols 38) Gain respect
Reasn24s (cols 39) Study birds
Reasn25s (cols 40) Photograph, draw or paint

Code Reasn1s - Reasn25s:

1 = Not at all important
2
3
4
5
6
7 = Very important

Question 12 Variable:

Site1s (cols 42) Viewing platforms
Site2s (cols 43) Nature trails
Site3s (cols 44) Day use facilities
Site4s (cols 45) Fee
Site5s (cols 46) Bird calls
Site6s (cols 47) Harvesting of natural resources
Site7s (cols 48) Tours or groups
Site8s (cols 49) Feeding stations
Site9s (cols 50) Information on rare birds
Site10s (cols 51) Regulations on behaviour
Site11s (cols 52) Hunting wildlife
Site12s (cols 53) Birdwatching walks
Site13s (cols 54) Interpretive centres
Site14s (cols 55) Other activities
Site15s (cols 56) Expert birdwatchers
Site16s (cols 57) Guiding or tour services

Code Site1s - Site16s:

1 = Strongly detract
2
3
4
5
6
7 = Strongly add

Question 13. Variable Years (cols 59-60) Number of years birdwatching

Code actual number of years.

Question 14. Variable Species (cols 62) Number of species respondent can identify without using a field guide.

1 = 0
2 = 1-10
3 = 11-40
4 = 41 - 100
5 = 101 - 200
6 = >200

Question 15. Variable Splist (cols 64-67) Number of species on life list
Code actual number of species.

0000 = Respondent does not keep a life list

Question 16. Variable Books (cols 69) Number of books owned.

0 = 0
1 = 1-5
2 = 6 - 10
3 = 11 - 25
4 = 26 - 50
5 = 51 - 100
6 = over 100

Question 17. Variable Mag (cols 71-72) Number of birdwatching magazine subscriptions.
Code actual number of subscriptions.

Question 18a. Equipment owned and used mainly for birdwatching.

Variable Binoc (cols 74) Binoculars

0 = No
1 = Yes

Variable Scope (cols 75) Spotting scope

0 = No
1 = Yes

Variable Camera (cols 76) Camera

0 = No
1 = Yes

Variable Lens (cols 77) Telephoto lens

0 = No
1 = Yes

Variable Tape (cols 78) Tape recorder

0 = No
1 = Yes

Variable Mic (cols 79) Parabolic microphone

0 = No
1 = Yes

Variable Feeder (cols 80) Birdfeeder

0 = No
1 = Yes

CARD 3.

Variable ID3 (cols 1-3) Three digit questionnaire number on front page
Variable Card3 (col 5) Card number - code 3

Question 18a.

Variable Box (cols 7) Nesting box

0 = No
1 = Yes

Variable Video (cols 8) Video or movie camera

0 = No
1 = Yes

Variable Decoy (cols 9) Decoys

0 = No
1 = Yes

Variable Boat (cols 10) Canoe or boat

0 = No
1 = Yes

Question 18b. Variable Eqpcost (cols 12) Replacement value of equipment

0 = No equipment
1 = $1 - 250
2 = $251 - 500
3 = $501 - 1000
4 = $1001 - 2000
5 = $2001 - 3000
6 = $3001 - 4000
7 = $4001 - 5000
8 = > $5000

Question 19. Variable Rec (cols 14) Major form of recreation

0 = No
1 = Yes

Variable Life (cols 15) Life organized around birdwatching

0 = No
1 = Yes

Variable Career (cols 16) Career related to birdwatching

0 = No
1 = Yes

Variable Friends (cols 17) Most friends connected to birdwatching

0 = No
1 = Yes

Question 20. Variable Level (cols 19) Self-rated level of expertise

1 = Casual
2 = Novice
3 = Intermediate
4 = Advanced

Question 21. Variable Startage (cols 21-22) Age started birdwatching
Code actual age.

Question 22. Variable Startpar (cols 24) Birded with a parent

0 = No
1 = Yes

Variable Startgrd (cols 25) Birded with a grandparent

0 = No
1 = Yes

Variable Startsp (cols 26) Birded with spouse

0 = No
1 = Yes

Variable Startrel (cols 27) Birded with an other relative

0 = No
1 = Yes

Variable Starttec (cols 28) Birded with a teacher/professor

0 = No
1 = Yes

Variable Startfr (cols 29) Birded with a friend

0 = No
1 = Yes

Variable Startgrp (cols 30) Birded with group of friends

0 = No
1 = Yes

Variable Startcl (cols 31) Birded with a club or organization

0 = No
1 = Yes

Variable Startme (cols 32) Birded by myself

0 = No
1 = Yes

Variable Startoth (cols 33) Birded with other

0 = No
1 = Yes

Question 23.

Variable:

Infpar (cols 35) Influenced by parent
Infgrd (cols 36) Influenced by grandparent
Infsp (cols 37) Influenced by spouse
Infrel (cols 38) Influenced by other relative
Inftec (cols 39) Influenced by teacher
Inffr (cols 40) Influenced by a friend
Infgrp (cols 41) Influenced by a group of friends
Infcl (cols 42) Influenced by a club or organization
Infoth (cols 43) Influenced by other

Code Infpar - Infoth:

1 = Not at all important
2
3
4
5
6
7 = Very important

Question 24. Variable: Thing1s (cols 45) Reading books, etc.
Thing2s (cols 46) Watching TV etc.
Thing3s (cols 47) Family nature outings
Thing4s (cols 48) Family member a birdwatcher
Thing5s (cols 49) Supportive family
Thing6s (cols 50) Joining an organization
Thing7s (cols 51) Afield with other birdwatchers
Thing8s (cols 52) Organized field trips
Thing9s (cols 53) Organized bird studies
Thing10s (cols 54) Taking courses
Thing11s (cols 55) Hunting
Thing12s (cols 56) Access to natural area
Thing13s (cols 57) Changes in life
Thing14s (cols 58) Birdfeeder
Thing15s (cols 59) Nest box
Thing16s (cols 60) Other

Code Thing1s - Thing16s:

1 = Not at all important
2
3
4
5
6
7 = Very important

Question 25. Variable Age (cols 62-63) Year of birth

Question 26. Variable Sex (cols 65) Sex of respondent

1 = Male
2 = Female

Question 27. Variable Childres (cols 67) Residence before age of 18

1 = Rural
2 = Urban

Variable Curres (cols 68) Current residence

1 = Rural
2 = Urban

Question 28. Variable Eductn (cols 70) Highest level of schooling

0 = No formal education
1 = Grade school
2 = Some high school
3 = High school graduate
4 = Some college or university
5 = College or university graduate
6 = Post-graduate degree

Question 29. Variable Income (cols 72-73) Combined household income

1 = <$10000
2 = $10 - 19999
3 = $20 - 29999
4 = $30 - 39999
5 = $40 - 49999
6 = $50 - 59999
7 = $60 - 69999
8 = $70 - 79999
9 = $80 - 89999
10 = $90 -999999
11 = $100000 and over

Question 30. Comments

Appendix III

Department of Forest Science
University of Alberta
Edmonton, Alberta
T6G 2H1

WILDLIFE CONSERVATION AND BIRDWATCHING: A SURVEY OF ALBERTANS' ACTIVITIES AND OPINIONS

Dear Study Participant:

Thank you for taking the time to answer these questions about your opinions and activities related to wildlife conservation and birdwatching. The questionnaire should take about 25 minutes to complete. Please try to answer all the questions which apply to you. Most of them can be answered by circling the number next to the answer you choose, or by writing in the blank space provided.

All information you provide in this questionnaire is anonymous. We cannot associate your name with your answers.

Please return your completed questionnaire in the postage paid envelope provided.

We appreciate your help in our research.

Dr. James R. Butler

Bonnie L. McFarlane

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SECTION A.

An important purpose of this study is to learn about how people may be involved in wildlife conservation and how they feel about wildlife.

Wildlife means wild animals, not pets or domesticated animals. It does not include animals in zoos or game farms.

1. During 1991 (January 1, 1991 to December 31, 1991) did you take part in the following activities?

	No	Yes
Read books, magazines or articles on wildlife	1	2
Watched films or T.V. programs on wildlife	1	2
Purchased art, crafts, posters of wildlife	1	2
Visited a zoo, game farm, aquarium or museum of natural history	1	2

2. During 1991, did you belong to a wildlife related organization (Birdwatching, naturalist, conservation or sportsmans' clubs)?

   1. No
   2. Yes ⟶ To how many organizations did you belong? _____ organizations

3. During 1991 did you donate money, not including membership fees, to any wildlife related organization?

   1. No
   2. Yes ⟶ About how much did you spend on your donations? $ _____.00

4. During 1991, did you maintain, improve or purchase any natural areas to provide food or shelter for wildlife? (By natural areas we mean wooded lots, hedges, marshes, sloughs, open fields ....)

   1. No
   2. Yes ⟶ About how much did it cost you to maintain, improve or purchase these natural areas? $ _____ .00

5. During 1991, did you work as a volunteer for a wildlife related organization or project? (Include time spent on committee meetings, Christmas Bird Counts, breeding bird surveys, fund raising activities, ...)

1. No

2. Yes ⟶ About how many hours did you work as a volunteer for a wildlife related organization or project? _____ hours

6. People differ in the ways they respond to wildlife. Some of these ways are listed below. Please indicate how you feel about the following by circling the number that best reflects your agreement or disagreement with each statement.

IT IS IMPORTANT TO ME PERSONALLY:	Strongly Disagree						Strongly Agree
That I talk about wildlife with family and friends	1	2	3	4	5	6	7
That I observe or photograph wildlife	1	2	3	4	5	6	7
That I tolerate most wildlife nuisance problems	1	2	3	4	5	6	7
That I trap furbearing animals for the sale of furs or pelts	1	2	3	4	5	6	7
That I consider the presence of wildlife as a sign of the quality of the natural environment	1	2	3	4	5	6	7
That I hunt game animals for recreation	1	2	3	4	5	6	7
That I see wildlife in books, movies, paintings, or photographs	1	2	3	4	5	6	7
That I tolerate most levels of property damage by wildlife	1	2	3	4	5	6	7
That I express opinions about wildlife and their management to public officials or to officers of private conservation organizations	1	2	3	4	5	6	7
That I know that wildlife exist in nature	1	2	3	4	5	6	7
That I tolerate the ordinary risk of wildlife transmitting disease to humans or domestic animals	1	2	3	4	5	6	7
That I hunt game animals for food	1	2	3	4	5	6	7
That local economies benefit from the sale of equipment, supplies, or services related to wildlife recreation	1	2	3	4	5	6	7
That I appreciate the role that wildlife play in the natural environment	1	2	3	4	5	6	7
That wildlife are included in educational materials as a subject for learning more about nature	1	2	3	4	5	6	7
That game animals are managed for an annual harvest for human use without harming the future of the wildlife population	1	2	3	4	5	6	7
That I tolerate the ordinary personal safety hazards associated with some wildlife	1	2	3	4	5	6	7
That I understand more about the behavior of wildlife	1	2	3	4	5	6	7

SECTION B.

This section will ask about your recent birdwatching activities and how you feel about the development and management of birdwatching sites in Alberta.

By birdwatching we mean the observation or study of birds, for recreation, in their natural habitat including in your backyard or neighbourhood. Do not include birds in zoos or game farms.

7. During 1991, in which of the following activities did you participate? (Circle all that apply)

1. Birdwatched or fed birds at home
2. Went on outings (less than one day) or trips (more than one day) for the main purpose of birdwatching
3. Birdwatched while on outings taken for other purposes such as picnics, camping, hiking, natural history outings, business trips, ...
4. None of the above → PLEASE SKIP THE FOLLOWING QUESTIONS AND GO TO SECTION E ON PAGE 12

If you went on any outings or trips for the main purpose of birdwatching please answer the following. Otherwise, please go to question 8.

a. In total, on how many different days did you birdwatch while on these outings or trips?

_____ days

b. What is the furthest distance you travelled from your home to the area you visited on these outings or trips? (Circle the one category that applies)

1. less than 1 kilometre
2. 1 - 100 kilometres
3. 101 - 200 kilometres
4. 201 - 500 kilometres
5. more than 500 kilometres

8. During 1991, in which of the following did you take part? (Circle all that apply)

1. Maintained a birdfeeder or nest box
2. Kept a list of the species you saw
3. Kept notes about the activities of birds you saw
4. Photographed, drew or painted birds in their natural habitat
5. Recorded bird songs
6. Took part in an organized bird census such as a Christmas Bird Count, May Day Count, breeding bird survey, or bird-a-thon
7. Led a birdwatching walk or tour or gave presentations on birds or birdwatching
8. Attended a birdwatching walk, tour or presentation on birds or birdwatching
9. None of the above

9. Please circle the statements that best describe you. (Circle all that apply)

When I birdwatch I <u>usually</u> do it :

1. With a parent
2. With my spouse
3. With my children
4. With an other relative
5. With a friend
6. With a group of friends
7. With a birdwatching club or natural history society
8. By myself
9. Other (Please specify) _____

10. Listed below are several people who may influence you to continue birdwatching. Please rate each as to their importance in sustaining your birdwatching activities by circling the appropiate number.

	Not at all Important						Very important
A parent	1	2	3	4	5	6	7
My spouse	1	2	3	4	5	6	7
Other relative	1	2	3	4	5	6	7
A teacher or professor	1	2	3	4	5	6	7
A friend	1	2	3	4	5	6	7
A group of friends	1	2	3	4	5	6	7
Members of a birdwatching club or natural history society	1	2	3	4	5	6	7
Other (Please specify):_____	1	2	3	4	5	6	7

11. Listed below are a number of reasons why people birdwatch. Please indicate how important each reason is for **your** birdwatching activities by circling the appropriate number.

ONE OF MY REASONS FOR BIRDWATCHING IS:	Not at all Important						Very Important
To learn about the natural environment	1	2	3	4	5	6	7
To get outdoors for a chance to enjoy the natural environment	1	2	3	4	5	6	7
To add species to a list	1	2	3	4	5	6	7
To build friendships with other birdwatchers	1	2	3	4	5	6	7
To help wildlife	1	2	3	4	5	6	7
To observe all types of wildlife	1	2	3	4	5	6	7
To see new or rare bird species	1	2	3	4	5	6	7
To expand my knowledge of birds	1	2	3	4	5	6	7
To get away from everyday problems	1	2	3	4	5	6	7
To challenge my birdwatching abilities	1	2	3	4	5	6	7
To be with birdwatching companions	1	2	3	4	5	6	7
To contribute to society's general knowledge and understanding of birds	1	2	3	4	5	6	7
To be alone	1	2	3	4	5	6	7
To improve my birdwatching skills and abilities	1	2	3	4	5	6	7
To be with family or relatives	1	2	3	4	5	6	7
To contribute to the conservation of birds	1	2	3	4	5	6	7
To compete with other birdwatchers	1	2	3	4	5	6	7
To meet new and different people who share my interests	1	2	3	4	5	6	7
To help others develop their birdwatching skills	1	2	3	4	5	6	7
To experience the sights, sounds and smells of the outdoors	1	2	3	4	5	6	7
To show species to family or friends	1	2	3	4	5	6	7
To be considered a good birdwatcher	1	2	3	4	5	6	7
To gain respect from other birdwatchers	1	2	3	4	5	6	7
To study birds in their natural habitat	1	2	3	4	5	6	7
To photograph, draw or paint birds in their natural habitat	1	2	3	4	5	6	7

12. Listed below are several statements about the management and development of birdwatching sites in Alberta. Please rate to what extent each would add to or detract from your birdwatching enjoyment by circling the appropriate number.

	Strongly Detract						Strongly Add
Viewing platforms and blinds	1	2	3	4	5	6	7
Clearly marked nature trails and interpretive signs	1	2	3	4	5	6	7
Day use facilities such as washrooms and picnic areas at popular sites	1	2	3	4	5	6	7
A fee to visit birdwatching sites ($1 - $5)	1	2	3	4	5	6	7
The playing of recorded bird calls by other birdwatchers	1	2	3	4	5	6	7
Presence of harvesting of natural resources such as forestry or oil and gas development	1	2	3	4	5	6	7
Presence of tours or organized groups of birdwatchers	1	2	3	4	5	6	7
Feeding stations to attract birds for viewing	1	2	3	4	5	6	7
On-site information about rare bird sightings in the area	1	2	3	4	5	6	7
Regulations on birdwatchers' behavior	1	2	3	4	5	6	7
Presence of other recreationists hunting wildlife	1	2	3	4	5	6	7
Opportunity to participate in birdwatching walks led by expert birdwatchers	1	2	3	4	5	6	7
Interpretive centres at popular birdwatching sites	1	2	3	4	5	6	7
Opportunities for other activities which require a high level of development such as swimming, boating, and campgrounds at birdwatching sites	1	2	3	4	5	6	7
Presence of expert birdwatchers to provide information on birds	1	2	3	4	5	6	7
Opportunity to hire expert birdwatchers for guiding or tour services	1	2	3	4	5	6	7

SECTION C.

Next, we would like to ask about your experience as a birdwatcher.

13. About how many years have you been birdwatching? _____ years

14. How many species of birds can you identify without using a field guide?

1. 0
2. 1 - 10
3. 11 - 40
4. 41 - 100
5. 101 - 200
6. more than 200

15. Do you keep a life list of the species of birds you have seen?

1. No
2. Yes ⟶ How many species have you listed? ____ species

16. Do you own books that are related to birds or birdwatching?

1. No
2. Yes ⟶ How many books do you have?
   1. 1 - 5
   2. 6 - 10
   3. 11 - 25
   4. 26 - 50
   5. 51 - 100
   6. over 100

17. Do you have a subscription to a birdwatching magazine? (Include only those that are specific to birds or birdwatching such as Birders World, Birdwatchers Digest, American Birds... Do not include subscriptions to general natural history magazines such as Nature Canada, Borealis, Canadian Geographic, Equinox, ...)

1. No
2. Yes ⟶ How many subscriptions do you have? ____ subscriptions

18. a. Which of the following equipment do you own that are <u>used mainly for birdwatching</u>? (Circle all that apply)

1. Binoculars
2. Spotting scope
3. Camera
4. Telephoto lens
5. Tape recorder
6. Parabolic microphone
7. Birdfeeder
8. Nesting boxes
9. Video or movie camera
10. Decoys
11. Canoe or boat
12. I do not own any birdwatching equipment ⟶ PLEASE GO TO QUESTION 19

b. How much would it cost to replace this birdwatching equipment?

1. $1 - 250
2. $251 - 500
3. $501 - 1000
4. $1001 - 2000
5. $2001 - 3000
6. $3001 - 4000
7. $4001 - 5000
8. over $5000

19. Please circle all the statements that you feel apply to you.

1. Birdwatching is my major form of outdoor recreation
2. I find that a lot of my life is organized around birdwatching
3. My choice of career was (or will be) based in part on considerations related to birds or birdwatching
4. Most of my friends are in some way connected with birdwatching
5. I do not feel any of these statements apply to me

20. Do you consider yourself to be:

1. A casual birdwatcher (not very interested and rarely birdwatch)
2. A novice birdwatcher (beginner, interested and learning)
3. An intermediate birdwatcher
4. An advanced birdwatcher

SECTION D.

We are trying to determine what things influence people to start birdwatching. We would like to ask some questions about how you became involved in birdwatching.

21. What was your approximate age when you first started birdwatching? _____ years old

22. When you first started birdwatching with whom did you usually birdwatch? (Circle all that apply)

1. A parent
2. A grandparent
3. My spouse
4. Other relative
5. A teacher or professor
6. A friend
7. A group of friends
8. An organized group such as a birdwatching club or natural history society
9. By myself
10. Other (Please specify): _____

23. Listed below are several people who may have influenced you to take up birdwatching. Please rate each as to their importance for you starting to birdwatch by circling the appropriate number.

	Not at all Important						Very Important
A parent	1	2	3	4	5	6	7
A grandparent	1	2	3	4	5	6	7
A spouse	1	2	3	4	5	6	7
Other relative	1	2	3	4	5	6	7
A teacher or professor	1	2	3	4	5	6	7
A friend	1	2	3	4	5	6	7
A group of friends	1	2	3	4	5	6	7
A birdwatching club or natural history society	1	2	3	4	5	6	7
Other (Please specify):	1	2	3	4	5	6	7

_____

24. Please rate each of the following as to its importance for you starting to birdwatch.

	Not at all Important						Very Important
Reading books or magazines about wildlife	1	2	3	4	5	6	7
Watching televison shows or movies about wildlife	1	2	3	4	5	6	7
Going on family nature outings as a child	1	2	3	4	5	6	7
Having a family member who was a birdwatcher	1	2	3	4	5	6	7
Having a family that was supportive of my birdwatching activities	1	2	3	4	5	6	7
Joining an organization such as a birdwatching club or natural history society	1	2	3	4	5	6	7
Going afield with other birdwatchers	1	2	3	4	5	6	7
Going on organized birdwatching field trips	1	2	3	4	5	6	7
Participating in organized bird studies such as the Christmas Bird Count, breeding bird surveys or bird banding	1	2	3	4	5	6	7
Taking courses related to birds or birdwatching	1	2	3	4	5	6	7
Having experiences in hunting wildlife	1	2	3	4	5	6	7
Having easy access to a natural area	1	2	3	4	5	6	7
Having changes in my life that gave me time to birdwatch	1	2	3	4	5	6	7
Maintaining a birdfeeder	1	2	3	4	5	6	7
Maintaining a nest box	1	2	3	4	5	6	7
Other (Please specify): _____	1	2	3	4	5	6	7

SECTION E.

Finally, we would like to ask a few questions about you to help determine if there are connections between people's backgrounds and their interest in wildlife and birdwatching experiences. We hope that you will answer all of these questions. We cannot associate this information with your name. However, if for some reason there is a question you do not want to answer, just leave it blank.

25. In what year were you born? 19___

26. You are:

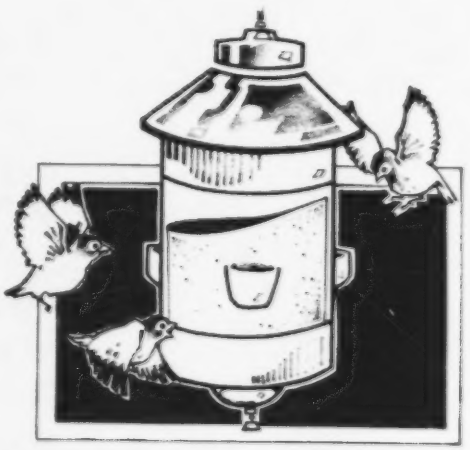
1. Male
2. Female

27. Which of the following best describes the area: (a) where you lived most of the time before you were 18 years old (b) where you currently live?

(a) Residence before age of 18 years	(b) Current residence
1. Rural	1. Rural
2. Urban	2. Urban

28. What is the highest level of schooling that you have finished and got credit for?

0. No formal education
1. Grade school (grades 1-9)
2. Some high school
3. High school graduate
4. Some college or university
5. College or university graduate
6. Post-graduate degree



29. Which category best describes your combined household income (before taxes) in 1991? (Circle the appropriate category)

1. less than $10,000	7. $60 - 69,999
2. $10 - 19,999	8. $70 - 79,999
3. $20 - 29,999	9. $80 - 89,999
4. $30 - 39,999	10. $90 - 99,999
5. $40 - 49,999	11. $100,000 and over
6. $50 - 59,999	

30. Do you have any additional comments?

TO RETURN THIS QUESTIONNAIRE, simply put it in the envelope provided and drop it in the nearest mailbox (postage has been provided).

THANK YOU FOR YOUR ASSISTANCE!

Appendix IV

University of Alberta
Edmonton

Canada T6G 2H1

Department of Forest Science
Faculty of Agriculture and Forestry

855 General Services Building
Telephone (403) 492-4413

Dear Study Participant:

Interest in wildlife and its conservation has increased dramatically in the past few years. Birdwatching has become a very popular form of wildlife recreation. However, very little is known about people's opinions and activities related to wildlife conservation and birdwatching. The University of Alberta is doing a study to determine this information.

You have been selected from among a small number of Albertans to participate in the study. Because only a few people have been selected it is important that each questionnaire be completed and returned. **Even if you do not consider yourself to be a birdwatcher your opinions are important to the success of this study.**

Since we are using several sources for our mailing list, you may have already received this questionnaire. If so, please complete only one and return it in the envelope provided.

All of your answers are anonymous. Since your name never appears with the questionnaire we cannot associate you with your answers. However, if there is a question you would rather not answer, just leave it blank.

The results of this study will be made available to agencies involved in wildlife conservation and management and outdoor recreation, natural history organizations and interested citizens.

We would be very happy to answer any questions you might have. Please write or call. The telephone number is 492-4413.

Thank you for your assistance.

Sincerely,

Dr. James R. Butler
Professor

Bonnie L. McFarlane
PhD Candidate